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MODERNIZING ENERGY AND ELECTRICITY DELIVERY
SYSTEMS: CHALLENGES AND OPPORTUNITIES TO
PROMOTE INFRASTRUCTURE IMPROVEMENT AND
EXPANSION

WEDNESDAY, FEBRUARY 15, 2017

House of Representatives,
Subcommittee on Energy,
Committee on Energy and Commerce
Washington, D.C.

The subcommittee met, pursuant to call, at 10:00 a.m.,
in Room 2123 Rayburn House Office Building, Hon. Fred Upton
[chairman of the subcommittee] presiding.

Present: Representatives Upton, Olson, Barton, Shimkus,
Murphy, Latta, McKinley, Kinzinger, Griffith, Johnson, Long,
Bucshon, Flores, Mullin, Hudson, Cramer, Walberg, Walden (ex

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officio), Rush, McNerney, Peters, Green, Doyle, Castor, Sarbanes, Welch, Tonko, Loeb sack, Schrader, Kennedy, Butterfield, Ruiz, and Pallone (ex officio).

Staff present: Will Batson, Legislative Clerk, Energy and Power; Ray Baum, Staff Director; Mike Bloomquist, Deputy Staff Director; Karen Christian, General Counsel; Wyatt Ellertson, Research Associate, Energy/Environment; Blair Ellis, Digital Coordinator/Press Secretary; Adam Fromm, Director of Outreach and Coalitions; Giulia Giannangeli, Legislative Clerk, Digital Commerce and Consumer Protection/Environment; Tom Hassenboehler, Chief Counsel, Energy/Environment; Zach Hunter, Director of Communications; A.T. Johnston, Senior Policy Advisor/Professional Staff, Energy/Environment; Peter Kielty, Deputy General Counsel; Brandon Mooney, Senior Policy Advisor, Energy; Annelise Rickert, Counsel, Energy; Chris Sarley, Policy Coordinator, Environment; Dan Schneider, Press Secretary; Hamlin Wade, Special Advisor, External Affairs; Jeff Carroll, Minority Staff Director; Jean Fruci, Minority Energy and Environment Policy Advisor; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; Jessica Martinez, Minority Outreach and Member Services Coordinator; Alexander Ratner,

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Minority Policy Analyst; Tim Robinson, Minority Chief Counsel; Andrew Souvall, Minority Director of Communications, Outreach and Member Services; Tuley Wright, Minority Energy and Environment Policy Advisor; and C.J. Young, Minority Press Secretary.

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Mr. Upton. All right. Good morning, everybody.

Today's hearing entitled Modernizing Energy and Electricity Delivery Systems: Challenges and Opportunities to Promote Infrastructure Improvement and Expansion marks the beginning of the subcommittee's push this Congress to promote the modernization of our energy infrastructure.

The hearing will examine the state of America's evolving infrastructure and barriers to innovation, modernization, job creation, and economic growth. America's energy infrastructure is vast, complex, and highly interconnected. When we say energy infrastructure, we are talking about the expansive network of pipelines, storage facilities, power plants, electric lines, and distribution systems that crisscross the country millions of miles. These systems and the people that operate them move energy from the source to the consumer so that when we flip the switch, the lights in fact will go on.

We are blessed to have the world's most highly developed energy infrastructure but our systems are aging and we are confronting new challenges with the changing energy landscape.

The huge increase in oil and gas production that we have seen in the last decade has been a boon to the economy, yes

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it has, but it has also revealed bottlenecks in capacity constraints in that pipeline system. These inefficiencies are harming consumers by discouraging new production and creating unnecessary price spikes in some parts of the country.

So our power generation mix is changing, too, as relatively low-priced natural gas and environmental regulations have accelerated retirements of coal-fired power plants, which represent a significant amount of our baseload power.

We have also seen the growing penetration of renewables like wind and solar and distributed energy such as energy storage. And while federal incentives have contributed to this trend, States have been very active in developing subsidies and mandates to incentivize renewables. Integrating these resources into the changing grid presents both challenges as well as opportunities.

So our first panel of witnesses will focus on the need to modernize our electric grid and develop solutions to strengthen security, improve efficiency, and reduce costs. We will hear from industry experts and businesses on the leading edge of developing new technologies and data analytics to improve the performance of our nation's

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electricity system. American consumers depend on reliable and competitively priced electricity for their everyday lives. And although new digital technologies have the potential to transform our nation's electric power grid, challenges remain to ensure that the grid is operated in a way that is reliable, resilient, and secure.

The second panel will focus on the need to modernize our transportation storage and distribution infrastructure, including pipelines. There is a new urgency to improve the siting and permitting process for pipelines. The domestic oil and gas boom and increased utilization of natural gas for power generation are driving new demand for pipeline infrastructure. So, we want to ensure that all relevant stakeholders, including Tribal Governments have a seat at the table and an opportunity to participate in a meaningful way. That is the purpose of today's hearing.

We welcome our witnesses, their ideas to reform the current process to implement lessons learned from past experiences. I yield balance of my time to the vice chairman of the subcommittee, Mr. Olson.

[The statement of Mr. Upton follows:]

*****COMMITTEE INSERT 1*****

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Mr. Olson. Thank you, Mr. Chairman.

Energy infrastructure is at the heart of the American economy. My own State of Texas has a vast network of pipelines moving products across the State to markets both home and abroad. We balance safety, community, and the environment. We do it in a very big way.

One mile from house in Sugar Land, Texas at Veterans Park on the Brazos River there is a dog park, a hill where kids fly kites, an off-road bike trail, a covered family pavilion. I often see kids fishing at the lake in our park. There is a natural gas pipeline 35 yards from where those people are fishing. We have proven that nature can be preserved, while balancing growth.

Texas is also a leader on advancing electronic markets. And since most of our State is on its own power market, we have a self-reliant and far-reaching electric grid. We are building that grid out, as we integrate wind power from the west to other emerging technologies. This committee has an opportunity to look forward on energy infrastructure. We need to not only make sure that this country can continue to build these networks but that we also make sure our energy is always advancing in terms of safety, reliability, and efficiency. We have to find proper balance, the sweet spot.

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We must find it. If we can find it in a park in Sugar Land, Texas, we can find it anywhere in America.

I thank the chairman and yield back.

Mr. Upton. Thank you.

The chair will now recognize the ranking member of the subcommittee, Mr. Rush from the good State of Illinois for 5 minutes for an opening statement.

Mr. Rush. I want to thank you, Mr. Chairman, for holding this very important hearing today on the challenges and the opportunities associated with improving our nation's energy infrastructure.

Mr. Chairman, this is a timely hearing and it is my hope that we can follow up on the bipartisan agreement that was initiated last session as part of the comprehensive energy bill that ultimately passed the House but never did make it to the Conference Committee.

As part of those discussions, Mr. Chairman, there are two provisions in particular that I hope we can bring to fruition this time around, specifically, the Pipeline Safety Replacement Program that would provide assistance to lower income communities that I have been promoting quite vigorously.

Additionally, Mr. Chairman, I hope that we can come

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together and agree to invest in modernizing the Nation's aging electrical grid infrastructure that Ranking Member Pallone has been advocating vociferously and very vigorously.

Mr. Chairman, it is important that as we embark on this path of upgrading our nation's energy infrastructure that we do so in a way that is responsible, environmentally conscious, and takes into account the rights and the interests of the impacting communities that are going to be immediately and deeply affected.

Even as we speak, Mr. Chairman, we are seeing the impact of shoddily built infrastructure in the national tragedy that is playing out in the State of California, where almost 200,000 residents have been evacuated due to leaks in the emergency spillway in Oroville Dam. Certainly, Mr. Chairman, this episode, in its entirety, could have been avoided if builders, if regulators had taken heed to the warnings of environmental groups who had forewarned almost a decade ago of the risk of catastrophic flooding but these individuals, these groups, these warnings were not heeded but ignored.

Mr. Chairman, it is important to remember that while some may consider common sense, safety, and environmental regulations to be overly burdensome or tedious, these protections may one day mean the difference in saving one's

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property, livelihood, or even life.

Mr. Chairman, I would like to refer to regulations as nothing but safety measures. That is what they are, safety measures.

Another aspect that is important to today's hearing will hopefully provide instructions in attempting to strike the right balance between modernizing and upgrading the Nation's energy infrastructure like we so desperately need, while also taking into account the rights of land owners, Native Americans, and other communities that might be adversely impacted by these types of projects.

Mr. Chairman, nowhere in this struggle is the struggle more pronounced than in the battle over the Dakota Access pipeline and I am sure that we will hear more about this from our second panel of witnesses.

Mr. Chairman, as policymakers, we all understand the needs for additional infrastructure to ensure the critical views and critical resources are transported to the places where they are needed in order to meet our nation's energy demands. However, as representatives of the people, Mr. Chairman, we must also ensure that the rights, the interests of Native Americans, property owners and less affluent communities are also protected and protected very vigorously.

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Mr. Chairman, Congress should help provide thoughtful and responsible guidance for instituting a fair and balanced process for moving forward with large-scale energy projects that respect the rights of all communities and does not place expedience or maximum profit among the rights of land owners or the communities that these projects traverse.

Mr. Chairman, I welcome today's witnesses and I look forward to a very rigorous debate on these very important and difficult issues. I yield back.

Mr. Upton. I appreciate the gentleman's statement. I do look forward to working with you to get the job done with Mr. Pallone and both Republicans and Democrats as we move forward.

It is time now for me to recognize the chairman of the full committee, the gentleman from Oregon, Mr. Walden for 5 minutes.

The Chairman. Thank you very much, Mr. Chairman. And as I said a couple of weeks ago to our first Energy Subcommittee chairman, we are all humbled by our responsibility of this committee and appreciate the power that we have to make policy changes that will have an enormous and positive impact on America consumers for decades to come.

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Today, we examine the challenges and opportunities to expand, improve, and modernize our energy infrastructure across the Nation. We will hear from builders, and laborers, and contractors, and energy producers, and concerned citizens. We will hear from Tribes and utilities at the forefront of these issues. Our infrastructure is undergoing rapid change -- rapid change on both the electrical and the energy producing side but there is one thing I think that unites both and that is these changes can mean real jobs.

On the first panel, we will hear from witnesses who will present a wide ranging view of the technology developments in the electricity system. The U.S. electrical grid is one of the engineering marvels of modern history but it is aging and it is under stress. The vast network that arose to deliver seamless uninterrupted power into our homes, schools and hospitals in a centralized and standardized fashion is being tested and challenged by the intersection of digital technology and innovation.

As technology continues to change the way we go about our daily lives, we also have to rethink how we generate, deliver and consume electricity. This could provide opportunities for consumers both large and small to save money and be more competitive.

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The meeting I held in my district a couple of weeks ago in Prineville, Oregon, they were talking to an outfit that wanted to locate there and bring hundreds of jobs, do a major build-out. Then they found out the electrical grid is not sufficient to support that. And when I pursued that with Bonneville Power Administration and others, they are telling me it could be 2 to 3 years before they could get the capacity this community needs. This community during the downturn had the highest unemployment rate consistently in the State of Oregon. How the heck did we get to this point?

When you finally think you have a chance to grow jobs, put people to work building things, you discover somehow the electrical grid is not up to snuff and that it could take a couple of years to get it there. That is not where we want to be.

That is why we are here today, by the way. That is part of it is we have got to do a better job of forecasting. We have to clear the roadblocks out of the way that aren't necessary, while still protecting the environment, while still providing appropriate ability for people to weigh in. You should always have the right to appeal your government decisions but it can't be an endless appeal that leads to situations that stop jobs and stop progress on making sure we

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have a safe and secure grid or that the pipelines continue to get the product where it is needed.

On the second panel, we will hear from all sides that area affected by the country's record-setting liquid fuels production growth. This growth has brought about tremendous opportunities to make our nation more energy independent, all the while creating thousands jobs.

At the same time, concerned citizens have come forward with their worries about the potential environmental impacts from new projects. The Dakota Access pipeline is currently at the forefront of those headlines and we welcome before the committee our witnesses from both the Standing Rock Sioux Tribe and the Dakota Access Project developer, Energy Transfer Partners.

We know that this issue means a great deal to both parties involved and we are here to listen. The committee welcomes all sides of the debate and we look forward to the testimony.

But the Dakota Access pipeline is not the only project that is currently being challenged across the country. The impacts and delays brought on by increasing amounts of uncertainty do nothing to open up a productive conversation about the true risks and benefits of these types of projects.

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We want to learn from the ongoing challenges presented to us today in order to bring more accountability, transparency, and predictability to the environmental permitting processes. The sooner our project developers and communities can talk about the risks and benefits within the community, the better. It is only by talking to each other and not past each other that we will be able to move beyond rhetoric and do what is right for our communities.

As this committee implements its own energy policy agenda, the testimony we take today will inform us on how to best approach the future so that we can embrace innovation and new technology for consumers.

We can be good stewards of our environment and we will, while we also pursue policies to grow our economy. They are not mutually exclusive goals.

We stand ready to listen. We are excited to work, and we thank you all for being here. And I yield the balance of my time to the vice chair of the committee, Mr. Barton.

[The statement of Chairman Walden follows:]

*****COMMITTEE INSERT 2*****

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Mr. Barton. Thank you, Mr. Chairman. We are looking forward to today's hearing.

Whatever your energy needs are, America has it. I had the Ambassador for India in my office yesterday and he wanted to talk about American energy going to India. If we have the energy, we have to be able to transport it. And in order to transport it, we have to be able to build transmission lines, pipelines, railroads, highways. That is what this hearing is about is how do we build our infrastructure to transport our energy in a way that is economically sound and environmentally safe. And I am sure at the end of this hearing, we will have a better understanding of how to do that.

With that, I appreciate the hearing and yield back.

Mr. Upton. The gentleman yields back.

The chair recognizes the ranking member of the full committee, the gentleman from New Jersey, Mr. Pallone for 5 minutes for an opening statement.

Mr. Pallone. Thank you, chairman.

Democrats strongly support modernizing our energy infrastructure, much of which is either outdated, on the verge of disrepair, or inadequate to today's needs. In the last Congress, we agreed with the Republicans on this

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committee on the need to provide funding to bring our electricity grids into the 21st century and to facilitate the repair of old leaky gas pipelines that waste resources and pose significant safety and environmental threats. In fact, we had an agreement with the GOP committee leadership to provide a total of \$3 billion for a Grid Modernization Grant Program and a Pipeline Repair Program modeled off the recommendations of the first installment of the Department of Energy's Quadrennial Energy Review.

Unfortunately, the full House Republican leadership, probably in response to the far right wing of the Republican caucus, opposed that plan and that led to the collapse of our bipartisan efforts here in this committee. Nevertheless, I am willing to try again. Infrastructure modernization is too important to our economy, to the public, and to workers to become a partisan issue. And if we do it right, we can enhance the environmental performance of the energy sector and protect vital natural resources. We need new and revitalized infrastructure to deliver energy, industrial feedstocks, and information safely, reliably, and efficiently. And it is going to take a substantial investment to realize this goal. This can't just become the package of deregulatory measures, tax giveaways to

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corporations, and fake investments through private-public partnerships. We need new hardware, new software, and new thinking, work that can and should be done in America by American workers for the benefit of all the American people. Our nation is filled with great minds and great technologies that can modernize our energy infrastructure to meet 21st century needs. We can make our infrastructure smarter, more flexible, and more resilient and we can significantly improve its safety and environmental performance.

Now, most of us can agree that our country's energy infrastructure needs to be upgraded. Yet, the most important question today is not whether we invest in our infrastructure but what types of infrastructure we prioritize. And I still believe that we should be focusing on federal funding to repair our aging gas pipeline distribution system and looking at ways to upgrade our electricity transmission and distribution networks to enhance reliability and efficiency, and to ensure sufficient power generation.

Now, I am a big supporter of expanding renewable energy generation here in the United States but I understand that a massive transition to cleaner energy sources won't take place overnight. As long as we continue to use fossil fuels, pipelines can be the safest, most environmentally benign and

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economically efficient ways to move these fuels. But pipelines are only a benefit if they are constructed, maintained and overseen properly and they must be sited correctly with due respect for the rights of Tribes, local governments, and individual property owners, as well as the environment. They must be constructed to high standards that ensure safety and protection of the communities and resources along their pathways and federal permitting agencies have a critical responsibility to ensure that these pipelines don't jeopardize the land, water, habitat and cultural resources that surround them.

So many of the problems we see with big pipeline projects like Dakota Access revolve not around the project itself, but the process for routing and constructing the line. We won't solve these problems with streamlining. Instead, it will take discussion, understanding, respect, and flexibility and that takes time but it is time worth spending.

With regard to the siting of natural gas pipelines, we need to not only modernize our infrastructure but also the law that governs its construction. The Natural Gas Act allows for the taking of private land in the name of the public convenience and necessity. That power was an

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important one when we were building pipelines to bring critical fuel to power plants and heat to homes. But now it is time to examine whether that power should be available merely to bring higher profit margins to some operators.

So, Mr. Chairman, these are important issues. This is a critical time to examine and plan for our future needs. Our past investments served us well for over a century. Now, however, we face new conditions and new challenges, including climate change. To retain our economic strength and robust job base, we need to get this right. Simply reinforcing old patterns of energy production, distribution, and use won't take us where we need to go.

And I want to work together to build the infrastructure that will deliver broad-based public benefits well into the future I hope we will not squander this opportunity to move forward. The time is now. The need is great and we have the resources to get this done. We only need the will to do it.

I yield back.

[The statement of Mr. Pallone follows:]

*****COMMITTEE INSERT 3*****

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Mr. Upton. The gentleman yields back. The time for opening statement is concluded.

We are very pleased to have our first panel with us this morning. We are joined by Mr. Michael Howard, President and CEO of Electric Power Research Institute; Mr. Ganesh Bell, Chief Digital Officer and General Manager for Software and Analytics for G.E.; Lonnie Stephenson, International President of the International Brotherhood of Electrical Workers; and Steve Hauser, CEO of GridWise Alliance.

I appreciate very much you submitting your testimony well in advance. I was able to read it last night. And we will give each of you now 5 minutes to -- your statement is made part of the record and we will give you 5 minutes to summarize your comments and move on from there to questions.

Dr. Howard, you are recognized. Thank you and welcome.

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STATEMENTS OF MICHAEL W. HOWARD, PRESIDENT AND CEO OF ELECTRIC POWER RESEARCH INSTITUTE; GANESH BELL, CHIEF DIGITAL OFFICER AND GENERAL MANAGER FOR SOFTWARE AND ANALYTICS, GENERAL ELECTRIC; LONNIE R. STEPHENSON, INTERNATIONAL PRESIDENT OF THE INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS; AND STEVEN G. HAUSER, CEO OF GRIDWISE ALLIANCE

STATEMENT OF MICHAEL W. HOWARD

Mr. Howard. Thank you. Good morning and thank you very much, Chairman Upton, Ranking Member Rush, and members of the subcommittee.

I am Mike Howard, President and CEO of the Electric Power Research Institute. This is our 45th day as an independent nonprofit company whose mission is to advance safe, reliable, affordable, and clean energy for society through global collaboration, thought leadership, and science and technology innovation.

Our annual research funding is over \$400 million a year, principally from the electric utility companies in more than 30 different countries. Our research focuses on the generation of electricity, the delivery of electricity, and the use of electricity, including energy efficiency.

Over the past couple of years, we have examined the

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forces that are changing the world's energy systems. We have gained insights through discussions with our advisors, leaders in the industry, regulators, academicians, science and environmental organizations financing government. We introduce our initial finding earlier this week at NARUC conference in a report titled The Integrated Energy Network: Connecting Customers with Reliable, Affordable, and Cleaner Energy. This report is provided to you as my written testimony and serves as the basis for my comments.

The Integrated Energy Network envisions a future in which customers have flexibility to use, reduce, and manage energy as they choose, while improving access to reliable, safe, affordable, and cleaner energy. I want to share with you five insights from the work and implications for infrastructure investment.

First, electric, gas, transport, and water systems are increasingly interdependent but their planning, operations, and regulation are largely separate. Closer integration could improve your liability, gain efficiency, and maximize value of energy customers, as well provide greater independence and security. We emphasize that infrastructure investments will be more effective if broad energy and natural resource implications are considered, rather than

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focusing narrowly in a single energy sector.

Second, advances in information and communication technology, sensors, data analytics modeling are key enablers for The Integrated Energy Network. These digital innovations enable greater customer engagement with their energy choices and control, while maintaining a focus on critical issues such as affordability, reliability, security, and data privacy.

Third, an essential near-term step is the full implementation of what we call The Integrated Grid, an integrated electrical system which fully realizes the value of central and distributed energy resources. The Integrated Grid is the backbone of The Integrated Energy Network.

Much progress has been made but we need to redouble efforts to create technical and communication standards, deploy modern electric grid technologies, and providing supporting infrastructure and oversight to accelerate the adoption of emerging electrification technologies. These advanced electrification technologies, to name just a few, include electric vehicles, advanced heat pumps, and water heaters. These more efficient electrification technologies have the potential, the opportunity to improve productivity, and efficiency while reducing emissions by using electricity

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where it is more efficient compared to other energy options.

Fourth, investment in the electric grid is needed to maintain reliability. The emergence of shale gas and rapid deployment of large-scale solar and wind have fundamentally changed the electric generating fleet, stressing an aging grid infrastructure. Rapid deployment of solar and wind generation increases significantly the value of expanding regional and long distance electric grid systems to enable more effective utilization as these have every important generation assets.

And finally, acknowledging advancements are essential to controlling costs and creating new possibilities in delivering and generating electricity, including next generation nuclear plants, advanced thermal fossil plants with carbon capture in storage. The generation fleet will need to be more operationally flexible to support a much greater end-to-end dynamic electrical system that puts the customer first.

More detail on the required actions and challenges to provide are provided in my written testimony. I very much appreciate the opportunity to be here this morning and I look forward to your questions. Thank you.

[The prepared statement of Michael W. Howard follows:]

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Mr. Upton. Thank you very much.

Mr. Bell, welcome.

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STATEMENT OF GANESH BELL

Mr. Bell. Thank you, Chairman Upton, Ranking Member Rush, and members of the committee.

I am Ganesh Bell, Chief Digital Officer for G.E. Power. I have spent my entire career in software and today, I work at the intersection of the industrial world, especially energy and software. I am one of 28,000 employees in a newly formed business unit in G.E. called G.E. Digital that is helping our 125-year-old company, our customers become digital business, and the industries that we serve, especially energy, become a digital industry.

This is a time of incredible innovation in business. Every industry, every aspect of our society is being reimaged through software. Low-cost sensors, ubiquitous connectivity, cloud computing, data science are presenting incredible opportunities to innovate a new industrial internet. The possibilities for the electricity industry is especially exciting. The 100-year-old model of electricity grid that our founder Edison helped proliferate is being tested, pushed, and challenged every day, as Dr. Howard would testify in his fantastic Integrated Energy Network paper.

Consumers are also becoming producers of electricity.

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The industry is in transformation. The future of the electricity infrastructure is not just the flow of electrons but electrons and data in multiple directions across our electricity highway. While these are some of the challenges, these are also big business model opportunities for every power producer and every utility. There are already one billion devices connected across electricity today. There will be seven billion devices by 2020. Power plants, wind farms, grids, substations, energy management systems already produce terabytes and petabytes of data a day. Less than two percent of that data actually is analyzed. The unused or underutilized dark data pulls massive value and potential for the entire industry.

Last year, we would say 2016 we believe was a tipping point of this digital transformation of the electricity industry. We help our customers and the power they release get more out of their existing assets and optimize their operations using digital technologies. Our customers can now monitor and diagnose every single asset across generations. It doesn't matter if it is gas, or nuclear, or renewables. They can monitor every asset across transmission distribution, even consumption of energy. So they can now forecast the yield from renewable energy, integrate them

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better into the grid. They can ramp up or ramp down fossil power plants, based on supply and demand. They can improve fuel efficiency, reduce grid losses, eliminate unplanned downtime, improve accuracy of the predictive maintenance and even improve the safety of the workers across the entire system using digital technologies.

And these ceilings are really, really meaningful. Leaders like Exelon, NRG, PSEG, and NYPA, New York Power Authority, are well on their way in their digital journey and these savings add up to massive value for the industry. The World Economic Forum estimates that in the next 10 years, just by deploying digital technology, there is \$1.3 trillion of value to be created. And the societal benefits are even higher, more than \$2 trillion over the next 10 years and especially three million new jobs at the intersection of software and electricity.

And there are other societal benefits as well, reduced emissions and also improving the reliability and affordability of electricity and access to every citizen on the planet.

Lastly, digital will help us capture the skills of an aging workforce. More than 25 percent of the electricity workers are going to retire in the next 5 years. We can

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capture their expertise and knowledge for the next generation in software and also encourage a new generation of digitally savvy workforce to join the industry to solve some of the biggest problems that we have ahead.

This is just the beginning. Just like Amazon, Apple, eBay, and Uber's software platforms change their industries, electricity and power producers now have the opportunity to transform all of generation, all of transmission, all of consumption into a new connected network that we call The Electricity Value Network, Dr. Howard calls The Integrated Energy Network, where it is really about the network and not a linear model anymore.

The grid was the foundation of the 20th century economy. The internet is the foundation of our digital economy. This Electricity Network will be the foundational infrastructure for the democratization of modern cities, intelligent transportation, and healthier and connected communities. America has an opportunity to lead. The country that invented the grid and the internet, two of the biggest innovations and important networks which are now coming together, America has an opportunity to lead this future. We need to remove the obstacles. We need to modernize our existing infrastructure. We need to modernize operation

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technologies all the way from sensor to cloud, cybersecurity.

We also need to prepare a whole new generation of digital workforce that are going to come in and transform this entire industry.

I thank you for holding this important hearing and welcome your comments.

[The prepared statement of Ganesh Bell follows:]

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Mr. Upton. Thank you very much.

Mr. Stephenson, welcome back. Nice to see you.

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STATEMENT OF LONNIE R. STEPHENSON

Mr. Stephenson. Good morning, Chairman Upton, Ranking Chairman Rush, and the members of the committee.

Mr. Upton. You might just move that mike just a little closer to you if it becomes --

Mr. Stephenson. Sorry about that. I will try it again.

Mr. Upton. There you go. That is better.

Mr. Stephenson. Sorry about that. I will start over.

Chairman Upton, Ranking Chairman Rush, and the members of the committee, thank you for inviting me here today.

Often when people think of infrastructure, they think of roads, bridges, or airports but perhaps even more important is our electrical infrastructure. The energy industry has changed in so many ways but too much of our existing infrastructure is still stuck in the 20th century. The configuration of our current grid, which largely functions on a localized, state-wide basis just isn't appropriate to meet our current energy needs. We need a truly national grid and new transmission lines that can safely and reliably transfer power, including renewables like wind and solar from energy rich regions to those parts of the country where it is most needed. And that means we need new transmission projects

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that will cross multiple jurisdictions and State lines.

Projects like the Plains and Eastern Clean Line. This is a \$2.3 billion line that would deliver low-cost energy throughout the southeast. This is not only a huge boost for energy consumers who can count on a cheaper and more reliable power supply but for working families throughout the region. This project alone is estimated to create and support more than 2,500 construction and manufacturing jobs and this only is one of the many planned transmission projects across the country and that could mean hundreds of thousands of new jobs.

But despite Clean Line's importance and clear economic benefit, it has bumped up against regulatory snags that continue to hold up the final approval. Just like the interstate highway system, the modern transmission lines of the 21st century can't stop at the State line. But it only takes only local commission or regulatory board to delay a project like Clean Line indefinitely. With all respect to all local authorities, we need a new approach to siting and permitting that trims the unnecessary red tape, streamlines the rules created by numerous regulatory authorities and lets us start breaking ground on these projects sooner rather than later.

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We in the International Brotherhood of Electrical Workers are the best trained, most professional workforce in the electrical industry. Electrical infrastructure is our business. It is our outside construction members who build the high voltage lines and our utility members who maintain them. It was our members who built the first electrical grid and have kept it running safely and reliably for more than 100 years. And under our Code of Excellence Program, we are fully committed to working with our employers to provide on-the-job excellence every day. Our members are ready to get to work modernizing and expanding our grid and our apprenticeship and training programs, which are second to none, will guarantee a steady stream of skilled electrical workers necessary for the projects that are so important to this nation's future.

We ask for your leadership on making this a reality and remain a ready partner with both our employers and our elected officials from both sides of the aisle to get this job done.

Thank you for the opportunity to testify before you here today.

[The prepared statement of Lonnie R. Stephenson follows:]

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Mr. Upton. Thank you.

Mr. Hauser.

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STATEMENT OF STEVEN G. HAUSER

Mr. Hauser. Good morning, Chairman Upton, Ranking Member Rush, full committee Chairman Walden, Ranking Member Pallone, and distinguished members of this subcommittee. I am Steve Hauser, CEO of the GridWise Alliance. I appreciate the opportunity to testify at today's hearing on such an important topic and with such distinguished colleagues on this panel.

In 2001, the Senate Energy and Natural Resources Committee asked me to testify before them on the opportunity to use emerging information and communications technologies to improve the efficiency and operation of the electricity grid. Then, 2 years later, during one of the most significant blackouts in U.S. history, I founded the GridWise Alliance to educate public policymakers and advance the modernization of the electricity sector. At the same time, the newly-formed Office of Electricity in the U.S. Department of Energy launched an R&D program to focus experts around the country on these same issues. And I might add that EPRI has worked in this area for just as long.

GridWise Alliance members include both public and private utilities from many of your States, technology

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companies such as G.E., transmission builders and operators from around the country, national labs, academic institutions and others.

From the very beginning, our goal was to represent the broad interests of all stakeholders who have a role in building and operating the electricity grid and we have advocated for policies that are clearly in the Nation's interest, rather than those of individual companies.

We applaud the leadership that this subcommittee and full committee have demonstrated over the past decade and more with the "Smart Grid" Title XIII of the 2007 Energy Independence and Security Act being a major policy change that has served to motivate many significant changes throughout the industry in the years since.

Today's hearing continues to demonstrate your desire to place a high priority on these issues and explore new policies that will continue to lead our nation toward an effective, safe, and reliable electricity grid for the next several decades.

The electric system is probably the most critical infrastructure and has been a major driver of our economic success for over a century. From the very beginning, Congress has recognized the need for effective national

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policies to drive the expansion and sophistication of the grid. Our digital economy, our national security, and all aspects of this sector and all other critical infrastructure sectors, and our daily lives depend on a reliable, safe, affordable, resilient, and secure electricity systems.

For many decades, we promised our citizens access to electricity anywhere, anytime and, I might say, as much electricity as they want to use. We have realized the need to change this paradigm, being more efficient and smarter about the ways in we use electricity, resulting in a much more complex electric grid, actively managing loads, installing generation closer to loads, and integrating new sources of power.

Over the past several years, the electricity industry has experienced fundamental changes on a scale not witnessed since the creation of the electricity system more than 100 years ago. Our nation's grid must continue to be modernized and evolve to respond to these changes. The future grid needs and will need to manage not only for daily operations that our digital economy requires, but also for increasing security, resiliency, reliability, consumer choice, affordability, flexibility, and more.

Fortunately, new technologies and capabilities have come

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along to help us address these changes. The challenge we face is that our infrastructure has not kept pace with these rapid changing needs and demands and technology opportunities. In addition, the business models and policies also need to be revamped to ensure the grid and grid operators remain viable.

One key point I want to leave with you today is that, because the electric system is critical infrastructure, and because this infrastructure is in desperate need of being modernized, GridWise believes that any infrastructure package that you can consider must include the electricity system and, as part of this, must address grid modernization or "Smart Grid."

Congress has an opportunity to demonstrate leadership with this regard. Grid modernization is an area that has garnered bipartisan support in the past and should continue to do so. Modernizing the grid will help create highly-skilled jobs and stimulate economic growth. It also will help reduce costs, and increase reliability, resilience, and security in the near- and long-term.

Nearly every State and most utilities are now considering the best way to modernize their electricity infrastructure, with some States and utilities leading the

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way. We recognize that each has its own priorities and constraints that result in unique policy approaches that fit its specific situation. What works in California and New York does not necessarily work well in Oregon and Michigan.

Regardless of the specifics, however, the technologies and capabilities apply almost universally.

And I respectfully refer you to the rest of my written testimony, which includes details and specific examples of changes that are happening across the industry and we look forward, representing my companies and the broader stakeholders to working with you to make these changes happen. I look forward to your questions. Thank you.

[The prepared statement of Steven G. Hauser follows:]

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Mr. Upton. Thank you. Thank you all.

We will now recognize ourselves up here for 5 minutes each for questions.

Dr. Howard, you mentioned that 25 percent of the workforce is going to be needed to be replaced within the next 5 years. Mr. Stephenson, I have seen your wonderful folks. I have seen the outcome of your apprenticeships. Are you going to be ready for that challenge?

Mr. Stephenson. Yes, not only do we, within our construction branch, have about around 300 training centers across the United States alone, where we train our inside and outside construction branches but also we work very closely with our utilities themselves and we have started the National Utility Industry Training Fund, where we have got four locations recognizing the number of our members that is going to be retiring out of the utility branch alone that we need to have an avenue to help utilities bring in more people, hire more people and get them trained as well. So, we have been working with our employers very close in that regard.

Mr. Upton. So, Dr. Howard, in your report, you indicated that smart meters in the U.S. among residential sectors is pretty close to 50 percent in the U.S. I think

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they are a little bit better in Europe is what you noted.

What is the trend line that we are on? What are some of the energy savings that we are able to see because of the advent or the roll out of smart meters in a good number of communities across the country?

Mr. Howard. So the trend line that we are on is full deployment of smart meters. They are a very, very important tool to not only --

Mr. Upton. They are all digital, right?

Mr. Howard. Absolutely, that is right. And it is important because from a customer's perspective, they can integrate and understand their use of electricity and other forms of energy as well but from the utility's perspective, it gives them a much clearer picture of where issues are. For example, if there is an outage and they can then restore it much faster because they have near perfect information and visualization of the electrical system.

So, it is an extremely important technology and one that we have been doing work with for a long time and it is going to be full deployment here very soon.

Mr. Upton. And as we see more and more homes going with solar displays on the roof or even wind turbines, are they able to measure the energy that is put back into the system

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as well?

Mr. Howard. Absolutely. It is a two-way flow system now that is much more dynamic and the smart meters are able to look at it both ways. You have got to have that, absolutely.

Mr. Upton. So, Mr. Bell, I want to hear a little bit. You asked that we do all we can to remove obstacles to, in essence, get out of the way. Particularly on the digital side, questions that I have, what have you done -- what can we do more to prevent a cyber-attack? I mean that is the fear that we all have, something that was in Ted Koppel's book, Lights Out, which I am sure that you have all looked at.

What are additional things that we can do to help the industry help folks like you to make sure that that is a never, ever occurrence?

Mr. Bell. Great question. From a cybersecurity it is important to understand that while across every business people take information or IP security very, very importantly. They should also take it through measures, operational technology. So in industries and especially in electricity, we need to think about everything from sensors to cloud. That means we need to think about modernizing age-

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old controlled systems. We need to think about security firewalls for all.

There is a misconception that connected systems are actually vulnerable. It is actually quite the opposite. All of our phones today are way more secure than any of our PCs are because a phone was designed for a connected era. We believe a connected asset is a safer asset. So, we have to make sure that power producers, utilities start connecting every single asset, make sure that they are monitored. That means when it is connected, they have the latest and the greatest updates of patches running. So, we have to make sure that there is incentives for power at least to modernize all their software systems. And also, we need security standards that industries can come together and not just around information technology but also around physical technology.

Mr. Upton. So as you mentioned in your testimony that you worked with a number of different power utilities around the country, is cyber -- do you have a special chapter on cyber threats and different firewalls that they need to continue to update and install?

Mr. Bell. Absolutely. Yes, so we offer a cyber assessment service for all of our customers. We also make

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industrial-specific cybersecurity fire walls.

And we are also working with partners because cyber is not just a single vendor problem. It is an industry problem. We have the Industrial Internet Consortium. We are working with lots of partners. We are furthering technologies and standards across the industry, especially in the context of adopting internet of things or industrial internet.

Mr. Upton. Are there any specifics that we can do legislatively to help you on your job to make sure that it is as foolproof as it can be?

Mr. Bell. Yes, along with working with institutions like EPRI, driving Industrial Internet Consortium Standards and the adoption of IoT technology.

So, specifically around Internet of Things or industrial internet in the context of energy, providing standards would be very helpful.

Mr. Upton. Thank you. My time has expired.

I recognize the gentleman from Illinois, Mr. Rush, for 5 minutes for questions.

Mr. Rush. I want to thank you, Mr. Chairman.

My question is in relation to Mr. Bell. Mr. Bell, my office received a letter from the National Urban League which, in part, noted the importance of job training and

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workforce development programs as an essential component of any comprehensive infrastructure proposal. Specifically, the letter discussed the necessity of including technical training, career apprenticeships, internships, and job placement opportunities for African Americans and other minority communities as a way to ensure that all Americans are able to fully benefit in the tremendous opportunities that abound before us.

As many of you are aware, myself and Representative Hudson co-sponsored a bill that would make training for women, minorities, veterans, and displaced energy workers a key priority.

Mr. Bell, in your written statement, you talk about significant job creation in areas such as data science, energy storage integration, smart asset planning, and asset performance management. And you note that as many as three million jobs could be created worldwide. You also cite significant challenges that industry faces and will continue to face due to the current aging workforce and the insufficient numbers of skilled workers ready to step in to replace these retiring workers.

Would you discuss some of these innovative partnerships that your company, G.E., has initiated and how some of these

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programs may provide a way forward for industry and for those communities that desperately need jobs and opportunities?

Mr. Bell. Fantastic question, Ranking Member Rush.

When you think about jobs, if you think about even myself, I said all my career I worked in software. Only in the last 3 years I am working at intersection of energy and software.

So first thing in G.E., we are making everyone aware that the industrial world, the world of electricity, healthcare, transportation, we need software developers and technology people. That is something we were driving at a company level, at an industry level. We are partnering with our customers.

For example, where in the past we only had a thermal engineer around power plants. Now, in the future, we think that thermal engineers are also data scientists. So, we have to train a whole new generation.

We are also doing things to balance the equation for women. We have programs around women in leadership, women in science, technology, and math, and we are driving programs to make sure that across the company we are actually committed to getting 20,000 more women by 2020 in the field of engineering, science and technology in G.E. and it is a

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worldwide commitment for us.

But the interesting thing about these jobs that we are talking about, which is at the intersection of software and energy is not just jobs in silicon valley or in New York because software means you can actually do it anywhere. And we also need them to be in the local communities, whether it is in Minneapolis or Eugene, Oregon, or Batesville, Indiana, you need electricity systems, consumptions systems in grid. So we believe the future of this intersection of jobs can be put anywhere across the country. And in fact, America can, just like Silicon Valley leads the digital economy, America can lead this new infrastructure of electricity and digital from here in America across the globe.

Mr. Rush. Mr. Stephenson, many of us understand the value of nuclear power and nuclear power plants are sourcing a reliable, safe, carbon-free energy. There has been no action at the federal level to fully value these plants. And in that absence, many States, including my home State of Illinois, are taking steps to preserve these plants as part of their energy infrastructure. These actions have caused a lot of controversy and, in some cases, they are being challenged at the local level.

We know that there are thousands of jobs at stake

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nationally. So, my question is what role do you think that the Congress can take to support these state-level policies and should we be involved in any of them anyway?

Mr. Stephenson. Thank you, Congressman Rush.

As far as the nuclear, I was very engaged with what was going on in Illinois the end of last year when Exelon was looking at possibly closing some of their plants there in Illinois. In fact the two units, Quad Cities, that is where I am originally from. So I was very close to that and very passionate to that.

But I could tell you the nuclear industry, the whole energy, when we talk about energy, and we are moving to the green economy. We are moving to more wind, more solar but we still have to have reliable baseload. And nuclear is a very reliable baseload energy that has really zero emissions. If our goal is to try to cut down on carbon emissions, nuclear is clean when it comes to carbon.

So I think there is a big role to play for nuclear. I think one of the problems they have is because of the price right now say of natural gas and some of the other power supplies that it is difficult for them to build and run reliably and economically because of the pressures economically that is put on them. And I think the action

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that was taken in Illinois and I think there was also some action taken in New York as well to recognize and preserve that they are already providing a good clean energy source is something that needs to be considered for the nuclear industry and make sure that we are keeping a good solid baseload, a reliable baseload that provides clean power.

Mr. Rush. I yield back, Mr. Chairman.

Mr. Upton. The gentleman yields his time back.

The chair recognizes Mr. Walden for 5 minutes.

The Chairman. Thank you, Mr. Chairman.

Thank you all for being here. I appreciate your testimony. It is most helpful to inform our decisionmaking going forward.

Mr. Stephenson, I toured Local 48 and the work they do there in Portland and throughout Oregon and been very impressed with training that goes on, the education that goes on and the work.

Mr. Bell, in your testimony, you cited some statistics about the efficiency of our generation fleet. And according to NERC, the U.S. fleet operates at less than 50 percent of total potential capacity. Generating units are unavailable on average 15 percent of the time due to outages and maintenance, 6 percent of the time they are unable to meet

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demand at all.

Is this purely a technological issues or are there regulatory barriers at the Federal level and State level preventing greater utilization and market efficiency in digitalization?

Mr. Bell. Great question, Congressman. We believe it is an untapped potential today. Like I talked about, a single gas-fired power plant, for example, could generate up to two terabytes of data a day. That is more data than all of us collectively in this room could even put on Facebook or Twitter over a year.

So there is more data. It is actually unused data. And we have been able to drive efficiencies as much as reduce unplanned downtime by 17 percent, increase uptime, therefore, by 10 percent or, in the case of nuclear, predict outages with accuracy of 90 percent.

And these are just the start, as the algorithms are getting trained on technology. For example, we already have algorithms that are trained on a 100,000,000 hours of operating data. So as they get trained on more operating data, we can get specific with recommendations not just about a particular class of a machine but about a machine in that particular operating condition. So we can get more specific

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about eliminating that 15 percent, which is a very meaningful number that we can make a dent into.

The Chairman. You know part of what we always have to keep in mind is both the efficiency but also the consumer.

Mr. Bell. Yes.

The Chairman. And so in my district we have thousands of megawatts of wind energy, enormous -- not enormous but we have a lot of solar energy, a lot of hydro power. We are a very renewable energy base.

We also, obviously, have other generating source, gas and I think we get electricity from coal from outside of the region but it comes in via the power lines.

As we work on renewable energy, one of the concerns that has come my way is it is not 24/7 baseload.

Mr. Bell. Yes.

The Chairman. And so often, that means you have to have a standby baseload plant you have to build and the consumers are ending up paying for both. How do we bridge that best? How do we get the best efficiency out of that? And what does this mean to consumers? Because price to consumers is an issue we need to be thinking about.

Mr. Bell. Absolutely. So, just like the example you shared, in renewables, for example, we are already using

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software to improve the predictability of energy yield from renewable resources. And that is absolutely key so you can plan the other fuel sources to compensate for the fluctuations.

And also, software is already helping baseload power plants be more flexible. We can ramp them up quickly and ramp them down quickly.

So regardless of what the mix of energy is to really optimize all of the sources of fuel, you need software because at the end of the day, it is an optimization problem and our customers are starting to use them individually now and some of them are actually building operation centers, where they monitor every asset, whether it is NYPA is, for example, building an operations center that monitors everything from Niagara Falls to all sources of generation and grid. So now we can get to a state where we can truly integrate renewables even better because by New York reg standards, they have got to get 50 percent renewables by 2030. The only way that happens is instrumentation of every single node, every single asset, and optimizing algorithms through software.

The Chairman. So, Mr. Stephenson, talk to me a bit about what your members have encountered in terms of jobs

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that are out there, the permitting processes, delays, from your experience necessary/unnecessary. What should we be focused on there?

Mr. Stephenson. Well as I mentioned briefly in my remarks, because of some of the permitting -- I will give you an example. Clean Line Energy has, I think, three or four projects where they are taking wind energy from out in the west where there is a big demand or an opportunity for wind and moving it east into the Chicago metro area and down into Indiana and down south through the Southeast. One of the problems they are having is getting that opportunity is getting all the proper -- you know each State they go through they have got a whole new challenge of regulations they have got to have to get through those States.

And so I have been working personally with Clean Line Energy probably for about 8 years the first time I met with them when they were talking about what their projects were.

So, some way to start getting that standardized for them to build and get their sitings for where they are going to put these towers. And in a lot of ways we have already got functioning towers all over the country. They have been there. So it is not like we necessarily have to always take a whole new path. I mean they are able to kind of parallel

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some paths where there is already towers there and blended in with the communities. But that is the biggest obstacle.

There are several projects that are waiting right now that if we could get through that process would be up and ready to go. And a lot of these projects, by the way are privately funded. These are the companies that have the resources ready to go. They just need to get the proper permitting to start.

Mr. Upton. Thank you, Mr. Chairman.

The chair would recognize the ranking member of the full committee, Mr. Pallone for 5 minutes.

Mr. Pallone. Thank you, Mr. Chairman.

Building new energy infrastructure is important but protecting and strengthening our existing infrastructure is as important, if not more so. And I think we need to do more to ensure that we are hardening essential infrastructure and making the grid more resilient and that means not just transmission but providing more flexibility and resilience within the distribution networks.

And I mentioned in my opening that I was very proud of the fact that at the beginning of the last session we did have agreement with the Republicans on the committee to have a \$3 billion grant program for grid modernization and

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pipeline repairs.

But I wanted to ask Mr. Stephenson, you spoke about the well-developed training program that IBEW runs for your members. And I wanted to ask has the program been expanding to train members to move into new areas, such as energy storage, nuclear technologies, and microgrids. And in your opinion, would a grid modernization grant program like I have discussed, providing grants to States actually help create jobs for your members?

Mr. Stephenson. Yes, it would because you know we are constantly training in the new technologies. As soon as we see new activities come in, our training program is always on top of it, starting to get our folks trained and ready for the changes as they come. But yes, it absolutely would provide that.

Mr. Pallone. Okay and then you mentioned that many members work in the nuclear utilities also and coal utilities. And you said that with respect to nuclear, in particular, that these haven't necessarily fared well in recent years.

Would some or all of the workers in coal or nuclear, would they be able to move into other jobs associated with the grid modernization of the electricity sector? If we have

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that kind of a grant program, would that be helpful to them?

Mr. Stephenson. Well it would help but one of the issues we face is that when you are going from let's say coal generation because coal has been changing rapidly over the years, where you might have 200 employees at a coal generating plant and that is being replaced by a natural gas plant. You know you might go from 200 employees probably down to 40 and then, of course, the renewables as far as wind and solar would even be less. After the construction, after they are built, there is less permanent jobs in maintaining them.

So we will see, overall, probably a reduction in our utility branch because of some of those technological changes but we also work very closely with our employers in the utility industry that, as they transition, our employees that are already there will have opportunities and have been offered opportunities to get training to allow them to stay employable in those new markets through those employers.

Mr. Pallone. All right, thank you.

I wanted to ask Mr. Hauser, you know my district was the hardest hit by Superstorm Sandy back in 2012.

Mr. Stephenson. Yes.

Mr. Pallone. It took an incredible toll on the

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electricity grid. More than 8.5 million households and businesses had outages. In some places, including my own house, the power took a couple of weeks to restore.

So as I said, a big part of our modernizing the electricity grid must include hardening our electricity infrastructure to protect the power lines, such as during a storm. Some of our utilities in New Jersey, such as PSE&G have made strides to protect the energy infrastructure but there is a lot more than can be done to prevent you know from a hurricane causing major power outages.

So in your testimony, you discussed hardening and resilience as important aspects of modernizing the grid. Kind of the same question I was asking Mr. Stephenson, would a grid modernization grant program providing targeted grants to States to support this effort, would that be helpful? What do you think about it?

Mr. Hauser. Absolutely. I mean we talk a lot about the public-private partnerships that are needed to really build out this system to be more resilient. As I am sure you know, many of our utilities are private. There may be 70 or so utilities private but there is almost 3,000 utilities across the country who are public utilities that absolutely need support to help do this.

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While it is important to consider the rate payer's need to support this, I think the taxpayers need to also look at opportunities to support this. And in particular, a grand program would look at potentially some innovative ways, some things that G.E. has already talked about, innovative ways to make it more cost-effective, certainly perform better.

Mr. Pallone. All right, thank you very much. Thank you, Mr. Chairman.

Mr. Upton. The chair would now recognize the gentleman from Texas, Mr. Barton.

Mr. Barton. Thank you, Mr. Chairman.

Back in 2005, we passed the Energy Policy Act and it put in place a procedure in congested areas if the Department of Energy designated a particular region as a congested or high-need region, set up an expedited procedure to site electrical transmission lines. A federal court in Virginia, on a two-to-one vote struck that provision of the Act down. So we certainly don't have an efficient way to site interstate electrical transmission lines. And given the growing needs of our economy, we need to move electricity from where it is generated to where it is consumed. And it is also impossible to do in these States in the Midwest and the Northeast where the geography is constrained and the populations are fairly

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dense.

I would like to ask Dr. Howard and Mr. Hauser if your groups have any ideas that we could legislate to try to solve that problem.

Mr. Howard. So you bring up a very important point. And as we add additional variable generation resources onto the electrical system, we do want to move it where it is needed. And congestion is a problem because that is where you run into generation and load kind of meet each other at the congestion points.

So we have done a lot of work on looking at advanced conductors, whether it is DC or AC to look at how we can advance the science and technology to help eliminate this problem. We are focused on the science and technology but what I can say is that the need for additional work around trying to eliminate or alleviate congestion is critically important because it is not going away.

In terms of the regulation that is required or some potential policies, we don't have a specific recommendation. Our focus is on the science and technology but what I can say is that when you look to the future, this is going to get to be a bigger and bigger problem unless it is solved because as we have more variable generation, it is going to be a bigger

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problem.

Some of the things that we are doing around sensors and computation and analytics, and information and communication will help some but it comes down to pipes and wires. We have got to have more wires to move this around.

Mr. Barton. Mr. Hauser?

Mr. Hauser. Building new transmission lines is certainly an important option that has to be considered going forward. There is a lot of work by companies that are looking at ways to use existing transmission line to upgrade them. That is kind of what Mike was talking about, make them more efficient, get more capacity through the existing systems.

You may be aware there is a project in New York now called the Brooklyn/Queens Demand Management Program that is a significant project that is looking at alternatives to building transmission to allow congestion relief in areas we call load pockets, where they do need more capacity.

So I don't think there is a magic silver bullet here to make this happen. I think we need to look at all options and certainly, in some instances, building new transmissions lines is the best option.

Mr. Barton. Well, Mr. Chairman, I am very disappointed

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with those answers, to be frank. I would have thought that great minds would have come up with some alternatives besides just suck it up and try to get more molecules and electrons through the existing system. If you are going to have a nation that grows and an economy that grows, we are going to need more transmission lines. There is a limit how much technology can do.

And I hope we can continue to ponder that because if we are really going to do something in this area in this Congress, we are going, at least in my opinion, Mr. Chairman, we need to come up with a way that respects the rights of the States and respects the rights of the communities but still makes it possible when there is an obvious need to build new transmission lines. We simply have to do that. And with that, I yield back.

Mr. Upton. The gentleman yields back.

The gentleman from California, Mr. McNerney.

Mr. McNerney. Well I thank the chairman for holding this hearing. It is really illuminating.

I am going to follow-up on Mr. Barton's last question. Mr. Hauser, you mentioned in your testimony that not only do we need new transmission, we need to focus on upgrading existing transmission facilities. Could you explain that,

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why we need to focus on -- what is the benefit of focusing on rebuilding or upgrading?

Mr. Hauser. Well, as an example, and I think Mike alluded to this, there is new conductors that allow you to put a lot more electrons through existing lines and existing right-of-ways so you can upgrade conductors, as an example, very cost-effectively and get a lot more power through the existing lines.

Mr. McNerney. So the technology is there to --

Mr. Hauser. Absolutely.

Mr. McNerney. -- to make it a cheaper way to go forward with our power needs.

Mr. Hauser. Yes.

Mr. McNerney. Do you believe the Smart Grid Matching Grants and Smart Grid Demonstration Project funding that was included in the American Recovery and Investment Act was a useful or good modernization in deploying new technologies?

Mr. Hauser. Oh, absolutely. I think almost two-to-one the utilities that were beneficiaries of those grants are thrilled with the results. And in many cases the utilities that are members of mine talk about how the benefits they have seen from those grants far outweigh the benefits they even expected to get from those projects.

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So yes, I would say that absolutely that is the case.

Mr. McNerney. Well, excellent. You mentioned that the grid isn't keeping up with new technology. How would we go about improving that situation?

Mr. Hauser. You know it is always a challenge, as my colleagues have talked on the panel already, it is always a challenge to find ways to implement these new technologies that are somewhat revolutionary, if you will. And I think the grants that Congressman Pallone talked about is certainly one way to show examples.

I think one of the things we are looking at is how to share lessons learned across the industry. So because there are so many utilities, one utility in Texas that is doing pioneering work in a particular area or Chattanooga, Tennessee, which does a lot of very impressive work, we want to take what they are learning and share it across the industry so that it is easier for the utilities and the regulators to accept some of the new technologies that are having such a big impact on the industry.

Mr. McNerney. Mr. Howard, cybersecurity and resiliency remain an essential piece of any component throughout an electricity or energy production system. Is there a uniform definition of what cybersecurity and cyber resiliency means?

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Mr. Howard. A uniform definition, I am not sure there is a uniform definition. I think there is a somewhat consistent awareness of the importance of it but I am not sure there is a common definition.

Mr. McNerney. Would it be useful to have a common understanding of what that means?

Mr. Howard. Certainly an increased awareness of what we can do and a discussion of some of the options that we could consider, all of that is very important. We are doing a lot of that at EPRI. So, yes.

Mr. McNerney. Different subject. How could real-time pricing rates affect grid modernization efforts?

Mr. Howard. Well, one is that it could help consumers have a -- and the devices themselves to have a better understanding of congestion, for example. We talked about that previously. So anytime that you can provide more awareness and understanding of the issues, whether it is the consumer or the devices where they can make smarter decisions on their own, those are important factors that consumers can include in their energy choice.

Mr. McNerney. Thank you. Mr. Bell, in about 30 seconds, what do you think the biggest obstacles to grid modernization are?

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Mr. Bell. The biggest obstacle is actual visibility, lack of visibility today. Because we think of the whole system as a uniform system and there is already enough data. We are not talking about new instrumentation. We are talking about making sure we use all the existing data to get better insights and better visibility so we can start writing a program or a roadmap of how to modernize step-by-step.

Mr. McNerney. Thank you.

Mr. Chairman, I yield back.

Mr. Upton. The gentleman yields back.

The chair recognizes the vice chair of the subcommittee, Mr. Olson, for 5 minutes.

Mr. Olson. I thank the chair.

Welcome, Dr. Howard, Mr. Bell, Mr. Stephenson, and Mr. Hauser. As you all know, in my home State of Texas, we have a huge amount of wind power coming onto our grid.

This question is for you, Mr. Hauser, and you, Dr. Howard. One year ago this month, nearly half the power in our grid came from wind turbines; 13.9 gigawatts of power from wind, double the capacity of any other State. Most of that wind is pretty far from our population centers so we worry a lot about things like line loss. At the same time, our plants that are closer to our cities are being closed or

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replaced, which can mean things like congestion to the system as the generation shifts.

Clearly, our grid is rapidly changing. In the Houston region, my alma mater Rice University at the Smalley-Curl Institute, it is advancing nanotechnology for a broad range of issues, mostly energy transmission.

Also, at Mr. Green's alma mater, the University of Houston, the Texas Center of Superconductivity Advancement is looking into power transmissions through superconductors. In fact, they are trying to rewire the whole main campus with superconductors.

Those are just two examples of how the grid could evolve. My question is, again, for you, Mr. Hauser, first, and then Dr. Howard. What are some of the technologies you see coming in terms of innovation for electric transmission and how can they shape the grid?

Mr. Hauser. Yes, well, you have given a couple of great examples already from the great State of Texas. I might yield to Mr. Bell from G.E. because a lot of the work is being done to move to digital silicon-based transformers, switches at much higher speed, much higher power densities, two-way flow on the grid, controllers that allow two-way flow, sensors, and other devices that allow us to manage

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reactive power versus real power, which is also an issue that comes up with increasing amounts of wind and solar on the grid.

Mr. Bell, do you want to add anything to that?

Mr. Olson. You have hit off, sir. You are up, Mr. Bell.

Mr. Bell. I think Mr. Hauser covered a lot of -- I think one of the simple ideas is while there is material science breakthroughs, new technologies, new electronics, we also believe that software closer to the edge needs to be changed and modernized.

Many substations, power plants are all still running controlled software that is like decades old. So, we are looking at algorithms that run what we call Edge, meaning closer to the machine so they can make intelligent decisions locally, just like Dr. Howard talked about, so they are aware.

When we talk about the network or The Electricity Value Network or The Integrated Energy Network, we mean that every node is aware of what is happening across the entire network so they can make local decisions about how to optimize routing, how to take load, and how to react to demands outside of the network.

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So, those are some of the innovations that are happening, actually, Mr. Tonko, right where you are, in Niskayuna, where we have our Global Research Center, this is where we talk about high-tech meets deep technology, where it is not just software but driving that innovation all the way down to the silicon and creating new kinds of value up and down a full integrated stack of technology.

Mr. Olson. Dr. Howard, you pulled the microphone, you are ready. Sir, you are up.

Mr. Howard. So we have talked a lot about digital communication centers and so on and that is pretty important but I want to mention three. One is, and you talked about superconductors, but it needs to be higher temperature superconducting materials. So that is one.

Second, low-loss conductors. There is a lot of work that is going on that will significantly reduce the loss on transmission cables and they are called low-loss transmission.

Three, power electronics. Our electronics, which will enable the digital grid is exactly what we need to move forward on, in terms of improving not only the congestion but the ability to increase the power on the existing right-of-ways and so on. It is akin to where we are headed, which is

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really a digital transformer.

Mr. Olson. 4 seconds left. I yield back the balance of my time and save my questions.

Mr. Upton. The gentleman yields back.

The chair would recognize Mr. Peters for 5 minutes.

Mr. Peters. Thank you, Mr. Chairman and thank the witnesses for some fascinating ideas.

You have highlighted a lot of the innovation that is happening in the economy into the private sector. I would like to explore a little bit what you think the federal role is here. And maybe, Dr. Howard, I would ask you are we talking about -- if we decided we are not going to do power loss conductors down the hallway. That is something that is going to happen appropriately in the private sector. If we were going to come up with actions that we can take, direct investment, grants, standard-setting, regulatory relief through federal preemption, what are the kinds of things that you think would be helpful for us to do to support the kind of grid that is in the national interest?

Mr. Howard. Probably the most important is the continued focus on basic research because all of these things we have talked about, whether it is high-temperature semiconductors, or advanced cables, or power electronics, or

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sensors, and so on starts, many of them start in the national labs with looking at fundamental material science. And I think that is one of the most important things that we can do to advance. Once the material is designed and we uncover the basics of the atom and its ability to work together to advance some of these technologies, then private industry can take it from there and apply it and make this the best grid possible. But it takes the fundamental science and research to help us get there.

Mr. Peters. Do you have an opinion on the adequacy of the current levels of funding in that field?

Mr. Howard. Low.

Mr. Peters. Low. Too low?

Mr. Howard. Yes.

Mr. Peters. So I get that. I think I would be supportive of that. How do you think, though, that we assure the outcomes? Obviously, the Nation has an interest in a grid that functions and that is resistant to attack, that is resilient, that is efficient, that conserves energy. How do you think we could, as a federal government, most productively assure that outcome through all the innovations that you are talking about today?

Mr. Howard. Well, one way is to encourage and support

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the application of these technologies. They don't just wake up one morning and say let's go and apply it. We have to start off with multiple demonstrations and learn from that to make it better. And the basic research it is conducting in the national labs, then you take that and move it into private industry and you support the need for multiple demonstrations and multiple science to then learn from that so that you can apply it and make sure it does the job that we thought it will do when we started the research. So, support the application and demonstration.

Mr. Peters. So some information sharing as well as the research.

Mr. Howard. Absolutely.

Mr. Peters. And do any of the other panelists want to talk about what the federal role? Any thoughts you have, Mr. Hauser?

Mr. Hauser. I will add a couple of things. First of all, we should have mentioned storage in the context of technology, too. That is a real game changer for this industry going forward. But I think technical assistance, building better models, better analytic models, we are really moving from a data poor to a data rich environment. So a lot of our models from a regulatory standpoint, from an

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operations standpoint have been based on not having much data about what is happening out in the system.

With the changes that are happening with AMI, with automated distribution systems, we are collecting so much data now and our models really haven't kept abreast of that and building better analysis, better models, is certainly something that could be done at the federal level or at least the support for that.

And the last thing I would say is technical assistance to regulators and to local utilities. Again, there is more than 3,000 utilities across this country. It is a very complicated stakeholder environment. And providing the education and the training, and the technical assistance is going to be really important.

Mr. Peters. So one of your points is that not all utilities are huge and have all the resources that they need to do this.

Mr. Hauser. Absolutely.

Mr. Peters. So am I to understand, too, that there aren't sufficient private incentives to take advantage of the kinds of technologies that Mr. Bell is talking about? Is that something that the Federal Government has to get involved in?

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Mr. Hauser. Yes, I think so. I mean there is always this dance between State and Federal roles with regard to this and we need to be respectful of both. But certainly, providing better incentives for new technologies, again, the utility -- and Mike can probably talk about this better than I can but historically, utilities install technologies that last 30, 40, 50 years and that is part of the issue that we have got is that we have got technologies in the systems now that were installed in the 1970s or even the 1960s. And so coming up with ways to allow them to put technologies that may not have 30- or 40-year lifetimes, they may have 5- or 10-year lifetimes because technology is evolving so fast is going to be really critical to this.

Mr. Peters. Thank you very much. My time has expired, Mr. Chairman.

Mr. Upton. Time has expired. The chair will recognize the gentleman from Illinois, Mr. Shimkus for 5 minutes.

Mr. Shimkus. Thank you, Mr. Chairman. And welcome. This is a great hearing and I read the testimony also and I have been listening to the question and answer and your 5-minute statements.

So I have gone off the rails a little bit here to ask some questions that I don't think people have asked yet. But

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actually Scott Peters asked great questions, I think Joe Barton asked some questions of really what is the federal role. Where can we be helpful? Where can we be harmful, right? And we can do both.

And plus the electricity generation and transmission world has changed just through competitive markets versus regulated communities. We haven't really started talking about that. Do you try to put the genie back into the bottle? Can you get incentivized?

So let me kind of ramble here for a few minutes. The other thing, I mean I see the laborers the crowd. I know you are with IBEW and this focus on jobs. My, I called him, Uncle Bob, he climbed power poles. I grew up with his kids. My dad was a telephone lineman, climbed poles and he fed seven kids and mine was a stay-at-home mom. So, that is the story of a lot of us in my era. So I have great appreciation for the work that is done.

But we don't talk, what we haven't talked about are these jobs here. These jobs. The IBEW guys at a power plant, the United Mine Workers at the coal mine, the pipefitters, the boilermakers, and the change that we are dealing with now is because we have lost these. They are under attack for a lot of reasons. So there are some issues

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about what can government do. Government can get off the back of the fossil fuel sector and allow us to -- major generation.

So in all of our debates, no one talked about major generation, baseload generation and the importance to the grid and the resiliency and the cost. So that is my first question, if you would go to Dr. Howard, across the first panel, I would appreciate it.

Mr. Howard. Thanks. So, we have for years been looking at the generation mix and what that means to security of the country. We have all of the research that we have done points toward the need for a full portfolio generation options, which includes the need for all forms of thermal generation, including nuclear and coal.

Mr. Shimkus. And they are all at-risk.

Mr. Howard. Well, we need them all.

Mr. Shimkus. They are at-risk. No one who is observing these markets will say that major nuclear, major coal is not threatened and at-risk.

Mr. Howard. Well, let me just --

Mr. Shimkus. Let me go quickly because I have got another question. So, Mr. Bell.

Mr. Bell. Sure, Mr. Shimkus, the role of baseload. The

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role of baseload, we actually, our biggest customers today use our software across baseload power plants.

If you take Excelon, who is one of our biggest customers, they are implementing our software across all forms of generation because being gas, nuclear and it is all about improving efficiency, reliability --

Mr. Shimkus. Okay, let me go to Mr. Stephenson. I get it. Excelon is a good friend of mine.

Mr. Bell. Yes.

Mr. Shimkus. Mr. Stephenson.

Mr. Stephenson. Yes, baseload is very important, as I mentioned earlier and especially all forms. I believe there is clean coal technology that still needs to be looked at and considered about some of the jobs that you just pointed out.

Being a former Illinoisan, I am very aware of what is going on downstate Illinois and the number of jobs that are at-risk there. And so I think there are still opportunities. And we, maybe as a federal government, could help fund some of the that technology, some of that research so that we can go into carbon capture questions and others.

Mr. Shimkus. And the Federal Government really has put a lot of money into that type of research already.

Mr. Hauser, baseload quickly. I have got one more

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question for you after.

Mr. Hauser. Yes, well, sir, clearly Illinois is the leader in this space. Excelon is one of my members.

You know I think what I would add to this is that the technologies we have been talking about that apply to the grid changes are also being applied to power plants. I mean power plants are becoming much more efficient. Sensors are being used to help us understand how to make them much more efficient, how to make the O and M much more effective and less costly.

Mr. Shimkus. And I liked one of the testimonies that talked about the downtime of the grid saved a million households didn't go out of power.

But Mr. Hauser, you also made a statement and I want to end with this. Aren't rate payers the same as taxpayers?

Mr. Hauser. I often joke that it comes out of either your right pocket or your left pocket. So, yes, the citizens --

Mr. Shimkus. So I mean there is a private sector so we just have got to be careful about how we apportion the cost and assume that one is not the other when they are actually the same people.

Mr. Hauser. Sure.

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Mr. Shimkus. I yield back.

Mr. Olson. [Presiding.] The gentleman yields back.

The chair calls upon the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. Green. Thank you, Mr. Chairman and I thank our witnesses for being here.

I represent a very urban district in Houston with refineries, chemical plants. G.E. actually shut down one of our plants -- not shut it down but because of the international market but we make turbines for whatever few you have.

Our problem in Texas is not -- because we build our own pipelines. We have our own grid. And so if we have wind power in Lubbock, Texas, they actually can get it to the Dallas-Fort Worth market, Houston market, San Antonio because it doesn't cross State lines. And we have our own grid, the ERCOT, that we can work ourselves.

But I know we have trouble with getting pipelines and getting electricity transmission permitted across State lines. But like I said, we don't have that problem but I am real aware of it because I would like to sell more natural gas to Mexico from Texas and we need to get those permits quickly done so we can sell that.

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President Stephenson, welcome. I work with your Houston locals both. In fact, I was down at our nuclear power plant in south Texas. It has been IBEW since it was built and the first time I had been back here.

We have a small amount of nuclear in Texas. We wanted to go expand it but because of the market and because one of our partners with Fukushima, Tokyo Power went bankrupt and they were one of our partners and we couldn't expand. And we have a lot of mix, whether it is wind power, nuclear power, of course natural gas, and in Texas, as my friend from Pennsylvania say you burn dirt, we burn lignite, which is probably one of the dirtiest we could do but we bring in a lot of coal from the Midwest for our coal-fired plants.

But the mix is changing, simply because of the cheap prices of natural gas. And we are seeing it literally at home.

But I want to talk about the workforce because I have a district that they work at those plants. And IBEW, you have partnerships with your local contractors, I assume, because you have a great apprenticeship program, but also with our community colleges. A couple of years ago, our previous Secretary of Labor, Tom Perez, was at San Jacinto Community College in my area and Congressman Babin's area and they were

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training for jobs that were available right then because they partnered with the large employers in the community and said show us what you need and we will let you write the curriculum because our goal is to get these students get those jobs and fill them. And we still had challenges on that in the energy industry but it is working.

Does IBEW partner, have a goal partnering with your apprenticeship program with the community colleges?

You might say yes, so that the record will take it up.

Mr. Stephenson. Yes.

Mr. Green. And does IBEW have expansion plans? I have been to your apprenticeship programs. They are actually in our district near Hobby Airport in Houston.

Mr. Stephenson. Yes, we are consciously looking at the projected workforce needs and adjusting our apprenticeships, trying to take in more apprentices to provide for the additional need to the skilled labor so we can provide them for our employers so that they can continue to bid that work.

Mr. Green. Mr. Bell, does G.E. partner with local community colleges and support workforce training? I don't know in my area because although we had that turbine plant but we have G.E. oil and gas buildings all over Houston, Texas.

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So do you all partner with local community college for that workforce training?

Mr. Bell. Absolutely we do. And we are also doing, for example, in New Orleans, we have an apprenticeship program where it is software engineering apprentice program that we are working in New Orleans. We partner with the universities in many different areas.

And also talking about the workforce question you talked about, when we think about digital infrastructure and network, it is not just the assets. We think about how the workers are becoming more productive and their work environments are getting safer. So we think about every worker in a power plant becoming a digital worker so they have all the information they need, whether through wearables or safety devices so they can help do their jobs better.

Mr. Green. Mr. Hauser, do the relevant federal agencies currently possess the required authority to expedite the Smart Grid siting and also the approval? And we are talking about interstate, not intrastate.

Mr. Hauser. So, there has clearly been a lot of discussion and debate around that issue. I think FERC is looking at that now in terms of what other authority might be needed to appropriately address that.

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So much of the Smart Grid work is being done at the local level, so it is really more State PUC focused and focus with the Governor and the State legislatures.

Mr. Green. Thank you, Mr. Chairman. I yield back.

Mr. Olson. The gentleman's time expired.

The chair calls the gentleman from Pennsylvania, Dr. Murphy, for 5 minutes.

Mr. Murphy. Thank you, Mr. Chairman. It is great to have you all here and I find your testimony fascinating as we recognize the problems with our grid and what we need to be doing for modernization.

A special welcome, Mr. Stephenson. It is good to have the IBEW, my friends here, as well as my Lonnie in the back as well.

But Mr. Hauser, I want to ask you some issues with regard to the grid. In my district, I have the National Energy Technology Lab, so it is funded by the Department of Energy doing research.

Mr. Hauser. Yes.

Mr. Murphy. And I think it is very important to continue funding to have that partnership. They also put a lot of grants out to the private sector, too.

With regard to this, what kind of areas in research and

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development can NETL have to invest in some approved -- you talked about resilience, reliability, and security in the system. Could you elaborate on where the public sector can be assisting this?

Mr. Hauser. Yes, absolutely and we have worked with the National Energy Technology Lab for more than 10 years in different spaces. I am aware right now that they are doing some work in power electronics. Controls is becoming a very, very hot topic. Again, G.E. is doing a lot of work in that area but NETL has some work going on in that area, looking at advanced control theory structures. How do you use the data that is being collected to a much more effective job of controlling what has become a much more complex grid and will continue to become much more complex.

Mr. Murphy. So this has continued to be pretty sophisticated as you go through this. Like when I go to the IBEW training facility, this is on a very high level. This is not my knowledge of electricity, which is just above dangerous. I know the black wires connect with black, white/white, and the copper, leave them alone, and then call somebody to connect the power and check my mess.

But as it goes through here, and the kind of controls that are developed by companies out there, G.E. and other

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ones, it is pretty sophisticated. But this is where we have this kind of alliance and working together of public and private sector. Can you give some examples of areas where we need to continue to push this or move this forward in these public-private partnerships to facilitate this? I mean you mentioned something with G.E. Can you elaborate on that a little bit more or if G.E. can elaborate.

Yes, Mr. Hauser.

Mr. Hauser. So, yes, public-private partnerships, of course, have been important in a lot of different areas. The labs, of course, work with companies like G.E. They work with utilities. A lot of the times it is proof testing, demoing these advanced systems so that they can be deployed more broadly and more reliably.

Mr. Murphy. You mean with the Smart Grid, for example?

Mr. Hauser. Yes, absolutely.

Mr. Murphy. Define that. Expand a little bit on that, how that works and the kind of work we can do to help.

Mr. Hauser. So the Department of Energy might put out a request for proposals where the company's team, EPRI is involved in those, many of my member companies are involved. Utility will often get involved to do some of the demo of a technology, maybe it is a new storage technology, and

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integrating into the grid. A lot of times the questions become how do you take it from a lab environment to a full-scale environment.

Mr. Murphy. In the context of what you are saying, one of the advantages I understand is Smart Grid. If you do it right, you are not wasting a lot of power. You are actually making it work more effectively, more efficiently along the way.

Mr. Bell, can you comment on that Smart Grid and how we can be facilitating that? Power waste is environmental waste, too. We don't want that. We want to create just enough and use it wisely. How do we do that?

Mr. Bell. I mentioned a World Economic Forum Study. They actually talk about across the world and a big part of that applies in America as well. More than 75 percent of breakdowns in generation, for example, can be prevented using software analytics. And more than eight percent of electricity that gets generated never reaches the consumer.

Mr. Murphy. Seventy percent.

Mr. Bell. No, eight percent of electricity that gets generated never reaches the consumer.

Mr. Murphy. Got it.

Mr. Bell. There are 75 percent of breakdowns that

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happen that can be already predicted and prevented. So we actually think that number could be even higher with software.

So when you think about eliminating breakdowns and preventing failures, as well as reducing transmission loss, you can actually yield more from existing investments that are out there.

And to the question of proof of concept, where the government funds -- environmental research is very, very important, as we talked about, but also funding new solutions, especially members that are part of the IoT Working Group, thinking about this as an option of cloud, an option of modern technologies, and setting up labs and proof points where --

Mr. Murphy. Mr. Stephenson, my final few seconds here. And what does this yield in terms of jobs if we move forward to this kind of Smart Grid? And just your workers alone, what are we talking about here, do you have some sense?

Mr. Stephenson. I am sorry, could you repeat that?

Mr. Murphy. Yes, I am just wondering in terms of jobs, moving forward on these issues to improve the grid, what does this mean in terms of jobs, just in your group alone, your unit alone?

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Mr. Stephenson. Well, there is the potential for a big demand as we continue to train the next generation of workers for these changes.

Mr. Murphy. Several thousand?

Mr. Stephenson. And due to the baby boomers that is leaving and the new people coming in, there is a big demand.

Mr. Murphy. Awesome. Thank you, Mr. Chairman.

Mr. Olson. The gentleman's time has expired.

The chair calls upon the gentleman from Pennsylvania, Mr. Doyle for 5 minutes.

Mr. Doyle. Thank you, Mr. Chairman, and thank you for convening this hearing today.

Let me start with Mr. Hauser. In your testimony, you mentioned the importance of Smart City Initiatives. As you know, Pittsburgh was a finalist in this new initiative that the Department of Transportation had last fall. And our city later received some funding for a component of its application and I think that this is a program that should be expanded and we hope the new administration will do that.

Can you just expand a little bit on what you think are some of the most important features of potential Smart City programs and how we should try to encourage such programs here at the committee?

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Mr. Hauser. Yes, absolutely. And I think it was Dr. Brown that mentioned as we understand and increase the sophistication of the electricity system, it begins to interact more, and more, and more with the other infrastructures, whether it is electric vehicles, autonomous vehicles, whether it is water systems either to cool the power plants or it is pumping required for agricultural use and other things, these infrastructures are increasingly becoming complex and interactive. And so it is really important, from a Smart City standpoint, that we look at the entire infrastructure, not just one infrastructure at a time. The interactions are becoming extremely important.

Mr. Doyle. Yes, I am glad you mentioned autonomous vehicles. With Uber and now Ford making their announcement, Pittsburgh is now claiming itself to be the autonomous vehicle capital of the world. So, we look forward to more research in that.

Let me go into nuclear, too. The QER 1.2 notes that nuclear power currently provides 60 percent of the U.S.'s zero-carbon electricity but existing nuclear merchant plants are having difficulty competing in the market these days.

I have been a long-time supporter of the country's largest source of carbon-free power and I am alarmed by the

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premature plant retirements that we are seeing across the country.

Mr. Stephenson, and let me say it is a pleasure to work with IBEW Local 5 in Pittsburgh under the leadership of Mike Dunleavy. Those guys do a great job. But each nuclear power plant employs between 400 to 700 people and the average plant also generates an average of almost \$16 million in State and local tax revenue annually and Federal tax payments of approximately \$67 million each year.

And this source of energy is vital for our local economies and critically important in our fight against climate change. Can you please comment on what the closure of some nuclear plants is meant for your workers and their communities?

Mr. Stephenson. Yes, we have had, for example, the ones -- we avoided this at this point but the Excelon you know had announced earlier they were looking at closing three facilities. And if they had done that, it would have been approximately \$3.6 billion out of the local economy and direct and indirect loss of jobs of around 13,300 that we had researched just for that alone.

In other areas, Zion, Illinois, for example, was a plant that was closed several years ago but if you read the

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research, they are still suffering. That community has still never recovered because it was built -- you know when those were built a lot of the nukes, they weren't in the metropolitan areas. They were more in the rural area. So those rural communities have grown and thrived because of the economy of the nuclear industry. And when they start going down, you decimate all those people that live in those small communities.

Mr. Doyle. Yes, Mr. Hauser, one of the other recommendations in the QER was to expand funding assistance to enhance analytical capabilities for State PUCs and improve access to training and expertise for smaller utilities. I think this is particularly important, given the rise in distributed generation resources.

Mr. Hauser. Yes.

Mr. Doyle. Do you agree with that? And if so, could you please expand on the challenges you see in this space?

Mr. Hauser. Yes, I do agree with that. And as I have mentioned earlier, there is almost 3,000 public utilities out there that are, many of them, struggling with these issues. As the systems become more complicated, as the data becomes more rich, we need better models and simpler models, I will say, for many of these utilities to use and they need

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training and technical assistance, certainly, to help understand and effectively use the models that are being developed.

Mr. Doyle. Yes, you know I have seen estimates of we will need to invest anywhere from \$500 billion to over a trillion dollars in our grid by 2040 or we are going to suffer decreased reliability.

I guess the question is to anyone on the panel. What is the best way for our committee to call for significant investment in the backbone of our country's energy infrastructure?

Mr. Olson. Quickly, please.

Mr. Doyle. More funding.

Mr. Bell. We believe that, as I said, just like grid was the foundation of the economy in the last century and the internet is the foundation of our digital economy, we have got to create a belief that the intersection of both creates this new electricity network, which is the foundation of the next set of economies. We just have to have that belief and invest with that belief.

Mr. Doyle. Thank you, Mr. Chairman. I would just note that while we are in sequester, that is the discretionary part of the budget what makes us tough to increase funding

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for basic research in this country and we all have got to find a way to get out of that sequester.

Thank you.

Mr. Olson. The gentleman's time has expired.

The chair calls on the gentleman from Ohio, Mr. Latta, for 5 minutes.

Mr. Latta. Thank you very much, Mr. Chairman and thanks very much for the panel. It has been a very, very good discussion this morning.

Mr. Bell, if I could ask the first question to you. In your testimony you talked about advances in technology and innovation in the electricity sector that point towards an increasing smarter grid. This could follow bidirectional flows of electricity, clear price signals, and a greater balance of supply and demand.

And a smarter grid system enables operators to identify reliability issues, address consumer concerns, and promote efficiency delivery of electricity to consumers.

If you could talk just a little about the smarter grid but let me take you back. I can't believe it, I just checked it has almost been 14 years ago that we had the major blackout and it hit Ohio, went into Pennsylvania, New York, Ontario. I couldn't believe it, at that time, I was actually

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in all those places about that same time. But how could a smarter grid, if you could take us back almost 14 years, how can we hopefully either stop that from occurring or how we could get things up faster from that massive electrical blackout that we had at that time?

Mr. Bell. So first is understanding the reason why. I believe you are also the co-chair of the IoT Working Group. And when you think about things that are already connected and the ideas that we have had about Smart Grid and interconnected systems and SCADA systems, and being able to monitor devices are not new.

But when you look at an interconnected set of systems, you get a system of systems, as Dr. Howard would call it, to be able to optimize the whole system. And what we see is a new network of data across all of the existing infrastructure that we have so we can actually get better at monitoring, better at predictive maintenance, better at preventative maintenance, and prevent all these outages because we do have the combination of not just the software-driven analytics but also physics-based analytics.

So being able to create virtual what we call digital twins, today we can actually create that. In the past, this was a challenge. Now I can have 100,000,000 hours of

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operating data being questioned in a matter of seconds at the speed of thought because of cloud technologies. So, adopting those technologies and making sure that we use all the data will give us insights into how to optimize the entire network.

Mr. Latta. Thank you.

Mr. Hauser, can you share some of the benefits of the grid modernization technologies that have enabled or provided in my home State of Ohio?

Mr. Hauser. Yes. So, AEP, in particular, has been a pioneer in this space. They have done a lot of work in storage. They have also done some work around involving customers and reducing outages across the system. As I am sure you know, ice storms come through Ohio periodically and take down lines pretty routinely. And having the utility able to identify the outages and redirect flows in order to minimize the impact on consumers has been really important. AEP has been an excellent example of doing that.

Mr. Latta. Thank you.

I would like to, in my last minute and half, maybe go to ask all of the full panel real quickly give a quick answer. From your vantage point, what are the most significant challenges that the U.S. electricity system or the industry

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is facing today? Mr. Howard.

Mr. Howard. So the most significant is the incorporation of the whole digital group. It is the technology modernization that is required to take us to the fully functional digital grid. And it is that infrastructure modernization that is going to get us there.

Mr. Latta. Okay, Mr. Bell, in about 10 seconds.

Mr. Bell. I said digital and I think it is also utilizing the existing assets more effectively. I think we don't have the visibility and insight across all the network. We can do that today with modern technologies like cloud and IoT.

Mr. Latta. Mr. Stephenson?

Mr. Stephenson. I think building the transmission line necessary to tie the whole system back together again from all the green energy. To get everything tied, we have got to have the transmission to get it there.

Mr. Latta. Thank you. Mr. Hauser?

Mr. Hauser. I think business models is going to be a huge challenge for this industry, especially the private utilities. Load growth is pretty flat in most places. In some places, it is actually going down and the business models have typically been built around growing load growth,

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where you have to build more power plant and earn a rate of return on the investment of large capital. So, I think there is going to have to be a real significant look at how do we make these business models work in a future grid scenario.

Mr. Latta. Well, thank you very much. And Mr. Chairman, my time has expired and I yield back.

Mr. Olson. The gentleman's time has expired.

The chair calls upon the lady from Florida, Mr. Castor -
- Ms. Castor, I am sorry, for 5 minutes.

Ms. Castor. I know I am the only female on the dais but
--

Mr. Olson. The biggest Houston Cougar fan, I believe, from Florida as well.

Ms. Castor. Well, thank you, Mr. Chairman.

I want to say that I share the enthusiasm of this expert panel on the great potential that modernization of America's electric grid holds. We really are at a turning point on the transformation of how we supply energy to consumers and businesses, whether it is how we are generating it, energy efficiency, Smart Grids, and technology, we really need to unlock the potential here and I see us kind of being held back.

Mr. Bell, you rightly identified that traditional energy

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infrastructure is becoming smarter and the mix of fuel is rapidly evolving with addition of more diverse and distributed generation sources. At the same time, we have a wave of connectivity and innovation.

And Mr. Stephenson, you are absolutely right. We can unlock higher wage jobs, higher skilled jobs, if we all work together to bring American ingenuity to bear here.

I have been to the IBEW training center in Tampa with Randall King and that great team there and they are ready to go. But it is oftentimes being blocked by our inability at the State level to do the kind of innovative thing that we need to do.

Consumers are more sophisticated right now. They are ready. They are clamoring for more tools to control their power usage.

Businesses are really in the lead beyond government because they see what it means to their bottom line and productivity and profits. But I look across the country and progress is very uneven.

The electric utility regulation largely happens at the State level and you have some States that are being very innovative and then others -- Mr. Hauser, you hit it on the answer to the last question. There are State regulatory

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schemes and business models that are stuck in 30 years ago and all of the incentives are on building big new plants, while all of the new tools that we have are about efficiency, demand management. Yes, we have got to keep that baseload. Yes, we have got to modernize the infrastructure across the country but what can we do here in Washington to really incentivize and bring those States that are laggards and have these old business models, what can we do here in federal policy to help create these highly skilled jobs and move towards a more innovative electric system?

Mr. Hauser. So, it is a great question. As you probably know, the State regulators are meeting in the other part of town, as we speak. These issues are things that they are discussing and debating. I am very impressed with how the discussion at the State level has evolved over the last few years.

I believe a lot of that has come from federal leadership and while you can't necessarily dictate what they do, you can certainly set ambitious expectations and goals for them to look for ways to live up to and I think that is one of the things that the feds at ear level really look at.

Ms. Castor. So how do we set expectations in federal policy? We can say this is good, this is bad but unless

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there is something really set forth in federal policy, how do we encourage those laggard States to do better?

Mr. Hauser. Yes, I don't have a great answer for that. I think as GridWise Alliance we do something we call the grid modernization index, which we look at all 50 States and D.C. and rank them on a score of zero to a hundred on how well they are doing.

Ms. Castor. Dr. Howard, there must be something better than just rankings and encouraging. Do these business models have to change to help incentivize energy efficiency and use of technology? What are the discussions that are being had?

Mr. Howard. Well, we are focused on helping to advance the science and technology so policymakers can make these more informed decisions. But we are seeing, as we have talked about here today, a variety of technology options that regulators and policymakers can use to help to make more informed decisions but that is our focus.

Ms. Castor. I think we can do a lot better and I encourage you all to be creative and be innovative and give us the best expert advice because we have, like I said, there is huge potential here for an economic revolution as part of the modernization of our electric grid and we want to do better.

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Thank you. I yield back the balance of my time.

Mr. Olson. The gentlelady, Ms. Castor, yields back.

The chair calls upon the gentleman from West Virginia, Mr. McKinley.

Mr. McKinley. Thank you, Mr. Chairman.

Mr. Stephenson, about maybe an hour ago you made a remark that resonated with me and I want follow up on what John Shimkus was talking about about reliability. Do you think that the markets should place more value on reliability attributes of our power plants, especially as it relates to baseload capacities?

Mr. Stephenson. Absolutely, we have got to have reliable baseload and that could be a combination of nuclear, I think coal should still be in a mix and can be, and of course natural gas. We have got to have that baseload reliability.

Mr. McKinley. Thank you. I guess the work is still ahead of us how we are going to convert. We have just gone through 8 years, we have seen a loss of baseload capacity across this country and we are going to have to rebuild now after 8 years of a war on coal.

So, Mr. Howard, your comment was interesting as well in your written statements about the need for carbon capture and

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clean coal technology and as it relates to demonstration plants. What is the incentive? What do we need to do to build more large-scale demonstration plants?

Mr. Howard. Well, there is still a lot of need for some basic research on understanding the more optimal approach to capturing carbon. We made some steps. We have got a project now going on in Texas. It is going to demonstrate one technology but it is going to take a full suite of different technologies to really enable a carbon capture storage to be economically efficient. And so supporting the demonstrations and advanced science and technology needed to come up with the right chemistry that will efficiently capture carbon.

Mr. McKinley. And also release some of the burdens that our regulatory agencies have put on for enhanced oil recovery from using carbon capture as well, I assume.

Mr. Howard. Right.

Mr. McKinley. No, Mr. Bell, the last question more to you. It is more for General Electric's position and that is, this wireless power transfer. It is probably aspirational. We see around the world Russia, and Germany, and Japan are moving into some pretty significant investments in that. What do you see coming with that? We know we already are using wireless with our cell phones, our internet access with

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wireless. We are seeing induction motors in our industrial plants. We are seeing others are wireless.

Where do you see G.E. moving in that arena in wireless power transfer?

Mr. Bell. I will answer the first part of the question --

Mr. McKinley. Could you use your mike, please?

Mr. Bell. I will answer the first part of your question, which is around the different source of fuel. Then, I will get to the other part.

See, we actually introduced the idea of how can existing power plants, whether it is gas or coal, be digital, with the idea of a digital power plant. We can actually reduce emissions in existing power plants using our software. So whether it is coal, or gas, or nuclear, whatever the source of fuel, we can rejuvenate existing sources and keep them functioning more efficiently and effectively.

With regards to wireless, there is a lot of fundamental research that is happening, not a whole lot of commercial-ready solutions at industrial scale. What we would do is we would get back to you with some of our research colleagues on what we see as the future of how that should be brought to market in a commercial way.

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Mr. McKinley. I don't think we are talking -- maybe eventually it is long-term transmission that would reduce some of the outages we have but that is not what I am talking about. I am talking more short-term within our -- to be able to, through induction coils, recharge our electric cars, same thing that we are already doing with our cell phones. Some of the fundamental ways of moving technology so that America continues to be the global leader on innovation.

Mr. Bell. Yes.

Mr. McKinley. So, I have run out of time, unfortunately, but if you could get back to me on that, I would like to know more from your perspective.

Mr. Bell. I would be happy to do that. We will follow-up on that.

Mr. McKinley. Thank you. I yield back.

Mr. Olson. The gentleman yields back.

The chair thanks Dr. Howard for talking about the Petra Nova Project and the Parish Power Plant there in my district in Texas. That is the only viable carbon capture enhanced oil recovery operation in the entire world. Texas brag.

The chair now calls upon the gentleman from Vermont, Mr. Welch for 5 minutes.

Mr. Welch. Thank you very much. Great hearing. Great

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witnesses. I appreciate you being here.

I will start with you, Mr. Bell. I liked your testimony. I have met with some folks from G.E. and you are doing a lot of good work on decentralizing, decarbonizing, and digitizing. But as I understand it, you are so confident in your business model that when you make some contractual arrangements with some of your customers, that you agree to be paid from the savings that you achieve on their behalf. Is that correct?

Mr. Bell. Yes, in addition to being a hardware provider, as well as services provider around the hardware, with our digital business, we started offering our software in a subscription model, just like every other software provider in the world.

Mr. Welch. So, you have very large customers that provide electricity into the grid. Are there benefits for individual consumers with the approach that you are taking with your technology and your coding?

Mr. Bell. Yes, absolutely. So what we look at, we want to help our customer's customers. So today, most of our customers, who are power and utilities, they see their customer as a meter. They have no insight into beyond the meter. So we are partnering with solutions.

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For example, we have a separate business that we call Current, that is driving energy efficiency for commercial industrial customers of electricity and we want to partner with power utilities to make sure that those systems are integrated back into them.

Mr. Welch. Okay, thank you very much and I appreciate the work you are doing.

Mr. Stephenson, I wanted to talk to you a little bit. You know we have a lot of jobs in this country but we don't have a lot of good paying jobs. And I think the issue is paychecks is actually more than jobs. A lot of your folks have good jobs and they help keep the lights on and I just want to acknowledge that and thank you.

Do you see there to be a big opportunity if we plunge into modernizing the grid to provide more folks with the kind of good jobs that your union provides?

Mr. Stephenson. Yes, absolutely, because we are going to need both our employers, our utility employers, and our construction employers are going to need to wield their workforce as this moves on. So yes, absolutely.

Mr. Welch. And I would be interested, I don't want you to take the time now, but your specific recommendations about job training. I know your union does a lot but that has got

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to be organically integrated into our educational system so that people who want to work can work and get jobs where they get a living wage. So I would really welcome, and I think the whole committee would welcome your concrete suggestions on that.

One point I wanted to bring up with you, you talk about the permitting process. And you have got some legitimate points there. How does it work? It has got to be fair but ideally, it is timely so that there is a fair resolution in a timely way and that includes access to people who have got altering different points of view.

But the last Congress we passed, and this was a bipartisan effort, the FAST Act, which, in part, created a Federal Permitting Improvement Steering Council to expedite permitting and environmental review for large infrastructure projects, namely, those over \$200 million. I don't know if you are familiar with that but would you regard as at least a down payment on trying to get this thing in better order?

Mr. Stephenson. I am not specifically aware of that. I do know this.

Mr. Welch. That is the idea that you are talking about.

Mr. Stephenson. Right.

Mr. Welch. To try to get an answer, get from here to

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there, sooner rather than later --

Mr. Stephenson. Absolutely.

Mr. Welch. -- but not cut corners on considering the valid environmental labor and safety concerns.

Mr. Stephenson. Absolutely.

Mr. Welch. Is that right?

I want to ask Mr. Hauser, with any new grid technology has to be fast enough to incorporate locally-generated electricity, which is the heart of oftentimes what renewables are. In Vermont, we have a focus on renewables and we have had a focus on efficiency. And actually by doing that, we have been able to save about \$400 million in grid repair and grid expansion. So there is a lot of money to be made in using less electricity or using it more efficiently.

How do we get the grid to work that way and how do we align it with the incentives that have to be changed for utilities that have generally been based on a reimbursement model, where the more they invest, the more they make?

Mr. Hauser. That is a good question and that is very impressive numbers, of course, in Vermont.

I think I am impressed. VELCO is one of my members. I have been impressed with the work that they are doing, for instance, on predicting weather and being much more accurate

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in how to predict the weather impacts and effects on the grid and that includes wind, solar, as well as storm recovery and so on. And so I think that is an example of some of the work that is going on to help make this much more effective.

Mr. Welch. Okay, thank you. I see my time is up.

Mr. Chairman, I hope we can get some very concrete suggestions from these witnesses about one, two, three, what we can do to facilitate the advocacy they are presenting here today.

Mr. Olson. We will do our best to make that happen. The gentleman's time has expired.

The chair calls upon the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. Griffith. Thank you very much, Mr. Chairman.

Dr. Howard, let me jump right in. We were talking about reliability of baseload, Congressman Shimkus, Congressman McKinley. And in your testimony, you talked about carbon capture, sequestration projects, et cetera. And one of the things you said is we have to have more research as a part of that discussion.

Some of my friends, even in the Obama administration Department of Energy, were advocating for parity in research dollars between clean-burning fossil fuel research and the

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renewables. Would you agree with that strategy?

Mr. Howard. I am not sure about parity. I would emphasize the importance of focusing on a broader energy mix, which certainly coal and nuclear, and other sources, including certainly renewables, is part of the mix. And we need to advance all of those technologies, including ensuring that the baseload generation, of which nuclear is a big part, continues to operate safely and reliably and coal is part of it as well.

Mr. Griffith. And I appreciate that very much, coming from a coal-producing region that has lost thousands of jobs in the last several years.

As a part of that, I have been very interested in chemical looping and so that is one of the reasons I would like to push research because it can be used both with coal and natural gas. And what it does for carbon capture and sequestration is if it works, if the demonstrations work out, we don't have as much expense on capture because what you get is CO₂. So, I am very hopeful for that.

I noticed you also touched on that we probably need to do some more research with carbon capture with bioenergy. And I am assuming that is algae. Are there other substances we can use? And I am one of those people that doesn't make

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fun of algae. We are not ready yet but it is a way that you can use the CO2 and use some plant materials. But is there something besides the algae?

Mr. Howard. And other biomasses.

Mr. Welch. And other biomasses, where they use the CO2 and convert it into additional energy.

Mr. Howard. Right and for some parts of the world, that is critically important to have those other options available. So, absolutely.

Mr. Welch. I do appreciate that.

Mr. Bell, I am going to switch to you and I am have to be a little parochial. I have a G.E. facility. Now it is not apparently in the same line that you are in but you did mention Current a minute ago. And my plant in Salem, Virginia, which we are very proud of, is G.E. Energy Connections, which is a part of the Connections and Current section. So I do want to say that.

And you also indicated that with your division, you all could create jobs anywhere. I have high unemployment on two ends of my district. It is about a 6-hour long district but on the south side and around Martinsville we have some high unemployment and then in the coal fields. So if you are looking for jobs, we have got all kinds of wonderful

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buildings and sites that we would love to show you.

But that being said, I do want to talk about something a little different before I get into just a general question and that is the United States has always used high voltage alternating current for the majority of its transmission lines, as opposed to high voltage direct current. The world is looking at direct current. The economists ran an article describing the growing use of long distance high voltage direct current power lines in China. It also references a project in India on which G.E. is working.

Okay, should we be looking at this? I think there is one project in the United States now. Should we be looking more at direct current?

Mr. Bell. I will add to the first part of your question, which is around coal and fossil fuel.

Mr. Griffith. Sure.

Mr. Bell. With regards to research and investment, I do agree with Dr. Howard that we believe all sorts of fuel need to be optimized. In fact, last year we acquired a company of 25 data scientists who work in the coal industry because clean energy means you have got to make everything clean. And we like the vision of decentralized energy, decarbonization and digitalization all working together.

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So, we will definitely look into that as we create more jobs, jobs in your region.

With regards to DC, obviously we are working technologies like that. I am not the expert on DC versus AC but if there are specific questions, we would love to follow-up with you and share with you what we are doing and when we think those technologies will be used for commercial purposes.

Mr. Griffith. I do appreciate that.

Mr. Bell. We do see it adopted in microgrids quite a bit right now.

Mr. Griffith. And I have got about 35 seconds so I am going to give you an opportunity to talk about something that maybe we haven't talked about that G.E. is working on that you think, particularly from your division where you are an expert, where you think that we can be helpful.

Mr. Bell. I think we have discussed most of the technologies today. Thank you.

Mr. Griffith. Well I do think that the digital aspects in making existing coal-fired power plants cleaner is a great way to go. I hope it is fairly affordable but we need people to not be afraid to use coal because everybody I have talked with, not only in this country but around the world, believes

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that coal will be a significant part of the mix well into the future. Would you agree with that?

Mr. Bell. Yes, we see that across the globe and increasingly more plants built around in Asia, for example. So if it is going to be part of the mainstay, we want to make sure it is optimized and it is clean. So, we want to provide the technology so our customers can make the best determination of what is the right fuel mix.

Mr. Griffith. And I agree with that. I yield back.

The Chairman. Would the gentleman yield just a second?

Mr. Griffith. I have negative 23 seconds, but you are welcome to them.

The Chairman. I just wanted to, on the DC issue of transmission, in about I don't know probably late 1960s, early 1970s, the Bonneville Power put in an intertie to California from The Dalles, Oregon down there. It is all DC. So we could hook up with Bonneville Power and all. It is, I think, very efficient.

Mr. Griffith. Thank you. I yield back, Mr. Chairman.

Mr. Olson. The gentleman yields back.

And the chair calls upon the gentleman from New York, Mr. Tonko for 5 minutes.

Mr. Tonko. Thank you, Mr. Chair, and welcome to our

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panelists. Great discussion. Important discussion.

I work closely with the industry, with the union, with the IBEW and am proud of the fact that we have been able to move forward with progress. A lot longer road to go but the commitment is there and I appreciate it.

Mr. Bell, earlier today you made mention of the intersection of the software industry and the electric industry and you also made mention of efficiency being required in the generation aspects, the delivery aspects, and consumption aspects.

So in the delivery area alone, is there some order of data analysis, as we do these analyses of the data compiled, is there a biggest area that you believe of promise as to how we can improve and make more efficient the delivery portion, the transmission and distribution ends of things?

Mr. Bell. Yes, so for us we have a simple vision that is across the entire electricity network. We want to start building. Just like Google organizes the world's information, we want to organize all of the analytics, all of the data science, all of the algorithms across the entire network.

We definitely started a lot in the generation space. We have a library of analytics and data science algorithms

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across all of distribution and transmission as well. When we look at end use, everything from congestion to world war, all of those ideas are still some of the biggest areas for our continued research.

I think right now the biggest challenge is most of these systems are opaque. Our customers do not have the right level of visibility and utilization of all of the data. So, as we look into more utilization of data, I think we will get better insights into what those outcomes could be that we can go generate.

Mr. Tonko. The best synergy, the best structuring of utilizing that and providing that service to professionals, what is the format? How do we best structure that?

Mr. Bell. So our customers are adopting our IoT platform that we call Predix and they are deploying solutions they call asset performance management. So it doesn't matter if it is a substation or a grid or a transmission or a distribution. All of those systems can be monitored so we can get better insights into.

So the best way is analytics, insights, and applications around being able to run those systems.

Mr. Tonko. Okay. And you mentioned the G.E. R&D lab.

Mr. Bell. Yes.

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Mr. Tonko. Very proud of the institution and the workers. The professionals are magnificent.

What are the effective ways to integrate renewables into the grid. Is digitization something that can best help that, support that integration?

Mr. Bell. Yes, today it is software at all levels. For renewables, for example, just about few years ago we were capturing data that was about every few minutes at a wind farm. Now we can capture data at every sub-second and all that data stays locally within that plant and we can make local decisions around how to optimize improvement in wind performance. So we are able to, just by software, for example in the last few years, we can improve wind turbine and wind farm performance by up to five or ten percent. That is five or ten percent more power from the same wind. But when you also combine that with forecasting and predictability, we now have better algorithms to integrate them into the grid. And when you combine that with the ability to ramp up or ramp down other sources of fuel, it gives operators confidence to be able to incorporate all sources of fuel into the mix and also confidently bid into the market.

So we think it is a combination across all of that and

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also the grid as well to be able to take on those new sources of fuel.

Mr. Tonko. Thank you. And Dr. Howard and Mr. Hauser, have you been sensing this also, that the smarter grid is making the integration of renewables a whole lot easier and more effective?

Mr. Howard. Absolutely and I would add one other technology that is important and that is the inverter. That is the device that fits between the renewable and the grid. And we have made tremendous progress in improving the technologies around the smarter inverter. So that is a big enabler.

Mr. Hauser. I was in the control center at Texcel just a few weeks ago and watched them manage a very large fraction of wind power on their system. And one comment that they made is that they actually can send signals to the wind turbine now, which they didn't in the past. So they can actually control the wind turbines up and down to meet the load.

Mr. Tonko. Now your groups have also been involved with DOE's research efforts and the Grid Modernization Initiative, I believe. And that has proved beneficial?

Mr. Howard. Absolutely. And the most important thing

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is what it has done is allowed us to demonstrate the technology and show that it works or not. And if it doesn't, we can improve on it.

Mr. Hauser. Tremendous capabilities across the lab system is, I am sure you are aware, including Brookhaven in New York and the GMI project at DOE has helped to integrate those, so that they talk a lot better amongst each other and they work together on joint projects very effectively.

Mr. Tonko. Thank you. Well, I see my time up, Mr. Chair, and I will yield back.

Mr. Olson. The gentleman's time has expired.

The chair calls upon the gentleman from Indiana, Mr. Bucshon, for 5 minutes.

Mr. Bucshon. Thank you, Mr. Chairman. Thank you all for being here. I will be brief.

I support an all of the above energy strategy. And I was in Europe recently talking with some energy companies and the question that I am concerned about is what do you do about the reliability of the grid when you have a large percentage of renewables that are counted on for baseload. And what they are finding in Europe is they are going backwards and building coal-fired power plants and other things because they have to have those for reliability

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reasons. So it is not just about generating energy. It is about reliability of the grid.

Does anyone have any comments about where we see America going? Because every coal mine in the State of Indiana is in my district. My dad was a United Mine Worker for 34 years. Everybody I knew was in the coal industry. It was a great job. My main concern is reliability of the grid and if we go too far and we don't have that backup -- look, I am all for renewables but we have to be realistic here. I would just be interested in your thoughts.

Mr. Howard. So what you are pointing out is the importance of not just having enough energy but having adequate capacity to fill in the voids. And that is one of the issues they ran into in Germany. And so we are getting to the point where we are energy rich but capacity poor and that reinforces the need for baseload generation.

Mr. Bucshon. I just want to reinforce what you just said. I mean we will just go down the line.

Mr. Bell. In Germany there was clearly a major problem. They had to curtail more than 1500 gigawatts. And we see challenges for power plants that were built in the baseload era to be actually competitive in the ancillary services market. So, we are actually using software today.

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In fact, there was a power plant in northern Italy that was shut down and we were able to reopen that power plant with software, purely through software because we are now able to make it competitive in the ancillary service market.

So every single power plant that is designed in a baseload era, we can actually make it flexible with software and technology so we can actually allow for the more integration of renewables and compensate for that with the void.

Mr. Bucshon. So quickly, how do you then -- say you have a power plant and you are running at 40 percent capacity. How do you have enough people there when something happens with renewables and you have to go to 80 percent capacity. I mean that is a challenge, right?

I mean Mr. Stephenson, you might comment on the workforce issues as it relates to this type of thing.

Mr. Stephenson. Yes, it is and like you said, to have that workforce there waiting. One thing about natural gas is they can fire up and shut down a gas unit a little quicker than say nuclear, for example, you pretty much have your workforce there around the clock but it is very important that they are there.

So there are different forms of baseload. Of course,

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coal, again, I believe should be in the mix, to have the opportunity to bring it up when needed. And maybe having some smaller units that are, as time goes on, smaller units that could be fired up and quicker in a faster manner.

Mr. Hauser. The industry has gotten so much better just in the last few years about being able to predict the wind and solar. And so they can anticipate it extremely well these days. So that is certainly helpful.

I want to do a short call out to Indianapolis Power and Light, who just won an award a couple of weeks ago from the industry for some of the work they are doing around storage. And storage is certainly going to be a key aspect of this as well.

Mr. Bucshon. I mean there is a real world example in the United States. A number of years ago we had that polar vortex. And I am talking to the energy folks and I am not an energy expert but in the northeast, for example, we were like really this close to brownouts because they had to buy power from I would say Midwestern coal-fired power plants and those plants had to ramp up and really run.

And the other thing is they didn't have the infrastructure in place for natural gas and other things. They were at capacity because of issues we have had with

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building out infrastructure in certain areas of our country.

So that kind of ties this whole thing.

And I think it is important for people watching this hearing to know that the reliability issue and the stability issue, not just how the power is generated, is really critically important to the future of our country and our economics.

And does anybody have any final comments? I have 30 seconds.

Mr. Howard. I would just say that is the importance of storing the energy on-site. Nuclear, you can store it 18 to 24 months. Coal, you can put it in a coal pile. In times of need, you don't have to ship it in. You may not be able to.

Mr. Bucshon. Thank you, Mr. Chairman. I yield back.

Mr. Upton. [Presiding.] Mr. Sarbanes is recognized for 5 minutes.

Mr. Sarbanes. Thank you, Mr. Chairman. I thank the panel.

We have an incoming Secretary of Energy. The Department of Energy, at one point, had talked about eliminating the Department of Energy. He has changed his mind on that, I imagine partly because if that happened he wouldn't have a job but also, I think, because he recognizes that we do have

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to make smart investments through a kind of partnering with private industry, with rate payers, and so forth.

So I would like to hear from each of you briefly your perspective, and you have obviously touched on this already, but the important role that the Department of Energy can play in leveraging the kinds of partnerships that can strengthen the grid across the country. If you want to site come examples of that kind of investment you have seen already, as you talk about what we can have going forward, that will be helpful as well.

I authored, in the last Congress on a bipartisan basis, a bill that would encourage and provide resources to the Department of Energy to give financial assistance to these kinds of public-private partnerships to make sure we are upgrading the grid and we are going to reintroduce that again and look forward to support for that kind of legislation.

So, I will just ask you to go down the line quickly.

Mr. Howard. Okay, thanks. We partner a tremendous amount with the Department of Energy and their national labs. It is an incredible resource that we have in the U.S., unlike any other country. It is important that we continue to encourage the development of basic research that will help us address many of the issues that we are facing here today.

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So, strong supporter, they are a great partner and we enjoy working with them.

Mr. Sarbanes. Thank you. Any other thoughts?

Mr. Bell. So, in addition to research at the DOE level, engaging private sector communities to go to drive innovation on top of that at the intersection of digital and hardware, and we would also say promotion of more industry-led performance standards. We don't need standard mandates. What we need is the industry will figure out where we need promotion of those standards and commitment for some policy to promote the support of these future technologies.

Mr. Sarbanes. Great.

Mr. Stephenson. The IBEW, we work very close with the Department of Energy and particularly with Secretary Moniz and what he has done with our director, Jim Hunter, who is the director of our utility department, we have worked very closely over the last few years talking about the energy, where we are going in the country and some of the needs. And so we think that is crucial to continue to have the Department of Energy involved.

Mr. Hauser. We certainly support the demonstration projects that you have talked about in your legislation. I have heard the modernization of the grid referred to a trying

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to modernize a 747 while it is in flight. So, it is not like we can shut down the grid, rebuild it, and then start it back up when it is all modernized. It has to happen in real time. So, demos become extremely important because we need to know for sure that these technologies will work in the way that we expect them to, when they are installed in the grid. So that becomes important.

Plus, a lot of the large-scale demos can be extremely expensive and Mike can certainly attest to that, that the industry need support, federal support for sure to do a lot of these demos that can be pretty expensive.

Mr. Sarbanes. Thank you.

Mr. Stephenson, I wanted to ask you a question. I had the privilege of working with a terrific partnership in Baltimore that is looking at installation of solar panels and basically trying to continue to aggressively in not just building that workforce but building that part of the energy portfolio. And I think you are probably very familiar with some of the statistics, the number of solar workers in the country increase by 25 percent over 260,000 and have been increasing by at least 20 percent every year for the past 4 years. One in 50 new U.S. jobs were in the solar industry, which is incredible. And the median wage for those

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installers is \$26 per hour.

So I wondered if you could just give us a few seconds on what kind of opportunities the solar energy part of the portfolio is offering to your members.

Mr. Stephenson. Well, you know solar is continuing to grow in leaps and bounds, not only large solar fields, if you will, but also individuals, people putting it on their homes and otherwise and starting to use solar.

For the installation, we get a lot of work installing those processes. But again, afterwards, there is not a whole lot of jobs that follows the installation, once they are up and running.

Mr. Sarbanes. Thank you. I yield back.

Mr. Upton. Thank you. The gentleman's time has expired.

The chair will recognize Mr. Long from Missouri.

Mr. Long. Thank you, Mr. Chairman.

Mr. Hauser, can you take a moment to describe what a smart Grid is and how it differs from the electricity systems of the past?

Mr. Hauser. Of course. I mean this has evolved over many years. It is still evolving. I actually like to talk about it as a smarter grid and not just a Smart Grid. Smart

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Grid sounds like a thing. What it is is an evolution of using technologies, communication technologies, sensors that have become very cheap and easy to install so that we can understand better how the grid is operating.

As you probably know, only just a few years ago, utilities didn't see anything below the substation. And now they do. And that is becoming increasingly important for them to see the operations, voltage levels, frequency levels, impacts on customers, outages and so on.

Mr. Long. Thinking about impact on customers, how does a Smart Grid or smarter grid, as you call it, expand the consumer choice?

Mr. Hauser. So it provides consumers with a much better insight into how they use electricity and how their use of electricity impacts the grid. So for instance, if it is 4:00 in the afternoon and the grid is being stressed and called on to provide electricity at a very high level and consumers are aware of that, they can reduce their usage in the afternoon to help stabilize the operation of the grid.

It certainly has become impactful in certain parts of the country when there is storms or when there is heat waves that really stress, can stress the grid.

Mr. Long. Okay, thank you.

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Mr. Stephenson, what can Congress do to improve workforce training and education for the electricity sector?

Mr. Stephenson. Well mostly, the training that we do specifically with our contractors is really self-funded. We fund ourselves. Through our collective bargaining agreement we have funding that goes into our apprenticeship programs. And so all the training we do is pretty much self-funded. However, we do rely, as brought up earlier, on community colleges and others to help prepare new employees, new members to come into our programs. But we pretty much fund our own system within the IBEW structure.

Mr. Long. Okay, thank you.

Mr. Howard, in your testimony you discussed the Integrated Energy Network where energy systems and services are more connected with the resources that they utilize.

You state that separate regulation of these systems can make it harder to realize any gains from integration. Could you discuss how the current technology process hinders this integration?

Mr. Howard. The current technology that we are talking about here enables more optimal integration. So it doesn't hinder. It actually enables it.

The communication centers, computation, analytics, and

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so on that we have talked about here really is an important enabler for allowing this energy system to be more --

Mr. Long. We are talking about the regulatory process. How does the regulatory process.

Mr. Howard. Okay, how does the regulatory? Well, I think it is an awareness that what happens in one energy sector, whether it is water, or petroleum, or others, does impact everything. And that is really at the heart of our discussion and our vision of the integrated energy network, that it all has to work together and you can't regulate it in one sector by the other. It has to be --

Mr. Long. That is my next question. What approach should regulators take to improve integration?

Mr. Howard. That is exactly what I talked about this week at NARUC, which is an awareness that all of this fits together. We have to look it much more holistically and step back and say if we are going to have a more resilient, affordable, safe, environmentally responsible energy future, then we have to look at it much more holistically and integrate it together.

Mr. Long. Talking about renewable energy integration, what are some of the industry challenges that you face?

Mr. Howard. What are some of the challenges we face

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with integrating renewables? Well, the one is that it is variable. And the variable generation of renewables with a baseload and the flexibility that we need not only across the entire grid but also the flexibility we need on both ends of the grid, both in generation and renewables. We are approaching an area here where we haven't ever had this. It is a two-way power flow, much more unpredictable, not as much forecastable, and not as much dispatchable. And when you put all of that together, that is why we absolutely have to have a more integrated energy network.

Mr. Long. Well, how can we strengthen and expand the transmission system to support the integration?

Mr. Howard. Well first is the recognition that we are going to need more transmission. We are going to need to upgrade the transmission system. We need to invest the money to modernize it, the infrastructure, the training, everything that we have been talking about here. You can't do this -- in fact I have said several times that if you want to move forward with a digitized, a highly dynamic interactive grid, you are going to have to have more grid. And that starts with the transmission, upgrading, modernizing, the same with distribution.

Mr. Long. Okay, Mr. Chairman, I yield back. Thank you.

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Mr. Upton. The gentleman's time expired.

The chair will recognize the gentleman from North Dakota, Mr. Cramer, for 5 minutes.

Mr. Cramer. Thank you, Mr. Chairman. Thanks to all of our panelists. A special thank you to Mr. Stephenson.

My daddy was a proud member of the IBEW for I guess 60 years, up until his death. And probably one of my proudest artifacts are his hooks, and his belt, and his hard hat, and his pin. So, welcome.

You all have covered so many things that every time one of you speaks I think of a couple other things I want to ask you. So I am going to focus on two things.

I am going to stay with the DOE because there has been some really good discussion lately. And I thought Mr. Sarbanes touched on some issues related to the R&D and some of you have spoken about how closely you work with DOE. And I have studied DOE fairly significantly in the last several months and one of the things in the R&D that I have noticed is there are these applied research sort of silos I call them. And that while there are wonderful innovators at DOE that you all work with no doubt, it seems to me we could even loosen that up a little more, maybe not have the research be so specific to -- I would rather see an outcome that would be

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achieved with more innovation at that level, working with our private sector perhaps.

Is that a relevant? It is not a criticism necessarily but we are going to be talking about DOE reorg eventually in this committee and I would like to see some real innovation take place in the reorg itself that could unleash some of these incredible resources there.

So, Mr. Howard, if you want to begin, that would be great.

Mr. Howard. So there is a lot of innovation that is occurring at the national labs.

Mr. Cramer. Right.

Mr. Howard. I have been to many of the national labs. I go there. I look at what they are doing and it is incredible. And we need to reinforce the importance of that and then get it out and get it applied.

EPRI is focused on applied research. We want to take that basic research and figure out the best optimal solution to solving these problems. So we are kind of on the back end. But if you don't have the front end, you are not going to have a back end. That is why I am emphasizing points of basic research.

Mr. Cramer. Anyone else? Mr. Bell.

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Mr. Bell. Yes, we love the idea of outcomes. In fact, we think yes, we should do fundamental science research and applied research, but to solve system-level problems, you need to look at the whole outcome. In fact, we have a business model that we call outcome as a service, just like our customers can buy software. And what happens is when you think about an outcome, whether it is fuel efficiency or integration of renewables or now we want to incorporate more mobility, intelligent transportation or electrified transportation, you intend to solve the whole problem versus pieces of the problem. So I do think there are big initiatives that when we think about the future of digital electricity infrastructure, we have big use cases to go solve. So we should look at some of those use cases as big outcomes that we want to go solve and fund research at that level, as well. We like that.

Mr. Hauser. I am certainly concerned that our current administration will look at DOE and look at it as an opportunity to reduce the funding for the good R&D that they do. As I am sure that you know, the funding at DOE has gone up and down over the years. That is not a good thing. It is difficult to manage against budgets that increase and decrease a lot. I think stability is very important for an

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R&D mission and it is also the focus sometimes tends to go more towards basic. And I think, as you have said, applied research, working with industry is extremely important, especially in this sector and especially now, these days.

Mr. Cramer. Well, I appreciate that. Mr. Hauser, what I would say is that I think without decreasing or increasing that R&D budget, by knocking out some walls, making the research more outcome-based, rather than fuel-specific or politically based, we can get a lot more out of the current budget.

With that I just want to end with a question about we have heard a lot of talk about double circuiting is what we used to call it when I sited many transmission lines as a regulator and we would build these massive towers for the future. And I think that is all great but sometimes I get a little concerned that we are willing to give up sort of geographic diversity, which is critical to that redundancy and reliability.

Do we need to be careful to not put all of our infrastructure in one corridor that one storm can take out multiple resources?

Mr. Hauser. Yes, and diversity is good.

Mr. Cramer. I like simple answers. With that, I yield

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back.

Mr. Hauser. Absolutely.

Mr. Cramer. Thank you.

Mr. Upton. The gentleman yields back. Seeing that there are no further members wishing to ask questions of the first panel, I want to thank you all for being with us for the last number of hours. I appreciate that. We all did. So you are now excused. That concludes our first panel.

We are going to take a few minutes to set up. I know originally we thought Panel II would start at 1:00. So, we are going to start 5 minutes early because we are expecting votes on the floor perhaps around 1:15.

So my goal is to have the second panel actually give their testimony. Then, we will adjourn, recess for the votes, and then come back for questions. So, that is what our intention is.

So with that, the first panel is excused. Thank you.

Thank you very much.

[Whereupon, at 12:50 p.m., the subcommittee recessed, to reconvene at 1:30 p.m., the same day.]

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AFTERNOON SESSION

Mr. Upton. We just had a series of votes on the floor and we are all walking back. And we did our opening statements earlier, so we will not repeat those.

I want to welcome you back. Sorry we are starting a little later than we had anticipated. We are now moving into our second panel. And as the first panel, we appreciate you all submitting your testimony in advance. I read all the testimony last night, actually yesterday afternoon.

So we are joined by Terry O'Sullivan, General President of the Laborers' International Union of North America; Mr. Rex Ferry, owner and CEO of VEC, Inc. on behalf of the National Electric Contractors Association; Kim Kann -- is it Kann -- private citizen. Moving testimony. Thank you again. Chad Harrison, Councilman at-Large of the Standing Rock Sioux Tribe; and Joey Mahmoud -- did I say it right -- Project Director of the Dakota Access Line.

So, again, your testimony is part of the record. If you would take no more than 5 minutes to summarize it, we will start with Mr. Harrison. And when we are completed, we will do questions on both sides of the aisle.

And I know the Democrats are on their way. They know that we are doing the testimony first. And again, they have

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read it as well but they will be coming in as our Republicans who are not here yet.

So, Mr. Harrison, welcome. Thank you. Thanks for being here.

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STATEMENTS OF CHAD HARRISON, COUNCILMAN AT-LARGE, STANDING ROCK SIOUX TRIBE; KIM KANN, CITIZEN; REX FERRY, OWNER AND CEO, VEC, INC. ON BEHALF OF THE NATIONAL ELECTRIC CONTRACTORS ASSOCIATION; TERRY O'SULLIVAN, GENERAL PRESIDENT OF THE LABORERS' INTERNATIONAL UNION OF NORTH AMERICA; AND JOEY MAHMOUD, PROJECT EXECUTIVE, DAKOTA ACCESS PIPELINE AND VICE PRESIDENT OF ENERGY TRANSFER PARTNERS

STATEMENT OF CHAD HARRISON

Mr. Harrison. Thank you, Mr. Chairman. Mr. Chairman, members of the committee, I am Chad Harrison, a Tribal Council member from the Standing Rock Sioux Tribe. It is an honor to be here today.

Mr. Upton. Would you just hit the button to make sure it is on or it is on closer to you?

Mr. Harrison. Okay. As the committee is well aware, Standing Rock Sioux Tribe has opposed the Dakota Access pipeline because of our concerns about our waters and our sacred sites. We have said from the beginning that impact of an oil spill would be devastating on our people and we have a strong obligation to future generations to protect them from that harm.

This matter is currently in litigation. Just yesterday,

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our lawyers filed for motion for summary judgment to address our basic claims. Our position is straightforward. The Army has never, to this day, evaluated the impact an oil spill would have on our waters or our treaty rights. That evaluation needs to be done through an EIS, as promised to us before that promise was then taken away a couple of weeks ago.

Our litigation raises basic issues of fairness. The pipeline was originally routed across the Missouri River north of Bismarck, away from our reservation but it was determined that the risk of an oil spill was too risky for the drinking water and wildlife interests near Bismarck. So, they rerouted the pipeline to cross the river just upstream from the reservation. How can a pipeline be too risky for the water supplies of Bismarck but be perfectly fine for the water supplies of my people?

We have seen this kind of treatment throughout our history and we believe that we are entitled to a greater measure of fairness and justice. Along these lines, I have read the testimony from Dakota Access to this committee and it strikes me that there is a deep underlying irony there. Dakota Access argues that it is the victim here. But Dakota Access is a multi-billion dollar pipeline company in which the

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President of the U.S. has been an investor and its CEO is a campaign contributor to the President. When in history has such a company been the victim of an impoverished Indian Tribe? The answer is never.

And when they say their pipeline is safe I ask then why was the original route changed if there is no risk of an oil spill at all. And why did you never allow an independent review of your secret documents on which you base your claims of safety? The point is, they are simply not telling you the full story.

These and other questions need to be resolved by the courts. And we are confident that the courts will vindicate the Tribe's position. But I am here today to discuss what I believe are some of the opportunities arising from our experience with this pipeline.

First, we do not oppose energy independence, economic development, or the protection of national security but these goals must be advanced in a way that recognizes and protects Tribal culture resources, sacred places, and resources. For too long, decisions have been made and the Federal Government has acted in a way that places too much burden on Indian Tribes. We can all achieve prosperity together, but only if the costs of development and infrastructure are shared

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fairly. It is time to end the long-standing approach of forcing Tribes to bear the costs of prosperity for others.

Second, Tribes need to be full partners in the process of infrastructure decisions from the beginning. I truly believe that if there had been meaningful consultation with the Tribe at the very beginning regarding Dakota Access, we all could have avoided the lengthy dispute that has arisen. When Tribal interests are ignored in the beginning, it is much harder to resolve the matter than when those interests are properly addressed by the federal decision-makers at the outset. Requiring proper Tribal consultation at the beginning lead to better results and less litigation about these matters.

Third, when we talk about meaningful consultation, we mean high-level government-to-government discussions that are comprehensive and collaborative that seek to obtain Tribal consent. All too often, federal agencies treat Tribal consultation as a check the box exercise, rather than a solemn obligation. This mindset must change, as the absence of proper consultation can lead to very extensive problems later.

Fourth, the law regarding these matters needs to be amended. Where oil pipelines are concerned, decisions are

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made in a piecemeal way and there is no process for considering the impact of the pipeline overall.

As far as Tribal interests are concerned, the law needs to be strengthened so that when Tribal treaty rights and lands are involved, Tribal consent is required or, at the very least, that the Tribe has the ability to impose conditions to protect Tribal homelands.

Committee, our Tribe has a voice and it demands to be heard on these issues. It demands to be heard on the front side of the issues, the front side of infrastructure development.

I want to restate that we are not against development of any sort. We are not against unions. We are not against jobs. We are for responsible and reasonable infrastructure development and we wish to be included. We wish to be heard. We are Americans. We are the first Americans and we wish to be treated as such.

Overall, we believe that more needs to be done to improve the processes of infrastructure approval for the benefit of native peoples and all Americans. We look forward to working with the committee on this important matter.

Thank you for your time.

[The prepared statement of Chad Harrison follows:]

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Mr. Upton. Thank you for your testimony.

Ms. Kann, welcome.

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STATEMENT OF KIM KANN

Ms. Kann. First of all, thank you for inviting me here today. My name is Kim Kann. I want to commend the earlier speakers today for the really relevant and compelling testimony about how the industry is helping to keep our lights on, and our houses warm, and our businesses energized.

I am a 33-year STEM teacher and I am cancelling my lesson plans tomorrow to share with my students many of the things that I learned here this morning because it was very exciting.

I'm here, however, to give a voice to the landowners who have had their dreams and financial security shattered by the unjust use of eminent domain for projects that are intended primarily to export U.S. energy.

I was blessed to raise my three sons on a small family farm in rural Lancaster County, PA and grateful to be able to give them the perfect childhood haven; a stream for building dams, hidden campsites for sleeping outside, and a small pasture for a few horses that could teach them about patience and responsibility. Nothing was handed to us. Everything was the product of careful spending, self-reliance, hard work, and the dream was to pass that property on to my boys.

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In the spring of 2014, my community was stunned to learn that William Partners intended to build a gigantic 42-inch 1580-pound per square inch Atlantic Sunrise natural pipeline through our community. So first, we studied exactly what that meant and we found that the proposal brought no benefit to us and potentially much harm and we opposed it; 1700 of 2300 registered voters returned petitions saying so.

And from the laundry list of harms we were facing, the issue of eminent domain was the most egregious. How could American landowners be forced to surrender their homes to a profit-making corporation that plans to export natural gas, while being forced to pay real estate forever on land that they would no longer own?

My story: My narrow 20-acre farm will now be cut in half. The far ten acres is only accessible by crossing a right-of-way that will be completely controlled by Williams. The bedrooms will be in the hazard zone, which guarantees catastrophic burns or death in the event of an explosion.

My story is echoed by my neighboring landowners, 36 who refused to sign easements in Lancaster County, people like John and Deb Swanson, who own a small farm. Much of their land will be taken and their home will lie well within the hazard zone. John is a proud Marine veteran who served

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America with honor. The country he defended is planning to allow a private corporation to take land that has been in his family for generations.

Or Laura and David Banta, who will have the pipeline pass feet from their bedrooms.

Or Linda Like, who has owned a small tract of farmland that she planned to sell for building lots to finance her approaching retirement. No one can build on it. So, retirement is no longer in her plans. She is trying to sell but no one is interested.

We get that sometimes land needs to be taken for the benefit of the community. So, we looked for benefits. And from this project, locally, there were none. And beyond that, we found negatives that far outweighed positives. We hired a pipeline feasibility expert, Dennis Witmer, whose results can be found on the You Tube video, A Perspective on Natural Gas Markets, who found that there is no domestic demand for the gas that is to flow through this pipeline. In fact, we currently enjoy low natural gas prices because there is a glut. And keep in mind, much of the gas planned for Atlantic Sunrise is for export.

There is no local access, so our community and our neighbors cannot connect into the line. Claims of jobs are

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misleading, as most workers come from far out of state. And how do you justify supporting new jobs to create wealth for some at the expense of other hardworking citizens? We discovered our beloved preserved farms with world class soils, 106 supposedly protected for eternity with tax dollars and private donations, were targeted because of their open space and reduced land value.

We started following the news and saw catastrophic pipeline failures in San Bruno; Appomattox; Salem Township, Pennsylvania; Sissonville, West Virginia; and just this week in Baton Rouge, Louisiana, where two men were gravely injured and one is presumed dead, to name a few. This raises the risk of evacuation, contamination, catastrophic explosion, or death in our community from zero to something much higher.

The route through my township of Conestoga passes through four state-registered Native American cultural sites and 86 along the entire route. We learned that fracking is contaminating water and frack waste is difficult to dispose of and natural gas is not as clean as advertised, with methane being 80 times worse as a contributor to climate warming.

I would like to quote directly from the GOP Platform for 2016 defining the American Dream. "It means a decent place

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to live, a safe place to raise kids, a welcoming place to retire. It bespeaks the quiet pride of those work hard to shelter their family and, in the process, create caring neighborhoods."

The reality of a decent, safe, guaranteed place to live and retire is about to be ripped away from us, many of us. A 30,000 more miles of pipeline as slated in Pennsylvania by John Quigley in his State Impact Report of 2015, using the numbers from our pipeline in our county, 137,000 Pennsylvania landowners could face seizure of private property.

And as powerful corporations profit from the gas that flows to export, they will pay inflated executive salaries and dividends to shareholders.

The reality is our financial assets, will be seized and redistributed. That is corporate welfare at its worst.

This is what it has come to. In our small, very conservative town, in just 3 weeks, over 500 local residents have pledged to participate in non-violent civil disobedience to stop this project and their numbers are growing daily. Although framed as radicals, and far left crazies, they are really just counselors --

Mr. Upton. Ma'am, if you could just sum up that would be great.

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Ms. Kann. Sure.

They are just regular people that would like to have their voices heard.

And I am asking that all of you, Democrats and Republicans alike, work to find a solution to this issue because they are going to make their voices heard, one way or the other. Thank you.

[The prepared statement of Kim Kann follows:]

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Mr. Upton. Thank you.

Mr. Ferry.

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STATEMENT OF REX FERRY

Mr. Ferry. Thank you Chairman Upton and members of the subcommittee for inviting me here today to testify. On behalf of the National Electrical Contractors Association, we greatly appreciate the opportunity to submit a statement for this important hearing.

My name is Rex Ferry. I am President and CEO and owner of Valley Electrical Consolidated, VEC, which is located in Girard, Ohio. I am also past president of NECA and having served from years 2009 to 2011.

Shortly after graduating from high school, I entered the electrical trades and began working for Valley Electrical. I quickly moved up through the ranks from foreman to project manager before making the decision to purchase the company in 1990. Our vision, VEC's vision is to serve others with integrity for the sake of our future generations and resulted in significant growth. VEC started as a family-owned business providing electrical contracting services in regional factories, automotive production lines, steel mills, and created the diversity it needed for sustainability for the future and employing as many as 400 workers across multiple trades during the height of the construction season.

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And our business is truly a family firm. We have 26 family members working across the spectrum. With the arrival of my granddaughter, I am pleased to say we now are a third generation family-owned company.

Energy production within the oil and gas industry has proven to be one of the most promising job creators and revenue generators in oil and gas markets are both directly and indirectly and they make up over 65 percent of our revenue over the past 6 years, which has allowed Valley to reinvest tens of millions of dollars in vehicles, equipment, tools, technology, and buildings.

Prior to the oil and gas energy boom, this scope of work experience was not prevalent in Ohio. In fact, it did not even exist in the Midwest. The area surrounding Youngstown, Ohio has tremendous growth directly and indirectly because of the Utica and Marcellus Shale oil and gas industry. In its peak, there wasn't a hotel room during the week available. And so this also is helping the hospitality industry.

A 2012 study commissioned by the U.S. Chamber of Commerce's 21st Century Energy Institute says the extraction of unconventional shale oil and gas through horizontal hydraulic fracking has created job boom even in States that do not actually have shale deposits; 1.7 million jobs have

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already been created and a total of 3.5 million jobs are projected to be created by 2035.

This growth extends into the chemical industry. A recent Price Waterhouse study shows that by 2025, Ohio, Pennsylvania, West Virginia will be the number one capitol producer in the world and creating one million new jobs.

The electrical construction industry has played a key role in assuring the U.S. will have adequate and reliable electrical power supply. In fact, the concept of the electrical construction worker has evolved dramatically over the past decade. Today, nearly 50 percent of the electrical contractors are performing work on almost 40 different project services.

In today's global economy, widespread adoption of the new energy technologies has slowed due to economic, government, and marketplace barriers. We believe there is a fresh opportunity for the Federal Government to unleash unprecedented development, exploration, construction, and production of this sector.

There are some challenges that must be met if we are to achieve these goals in moving the fruits of our energy development to market. Now is the time to fully invest in the Nation's infrastructure. We are very encouraged by the

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actions of the pipeline construction taken by the Trump administration. From VEC's experience, I can report in the last couple of weeks the opportunities have increased dramatically.

Thankfully, this committee has helped overhaul environmental review of infrastructure projects and we believe even more can be done to ensure permitting decisions are made in a timely manner. Electrical construction companies want to grow and they need capital to make that happen. We urge Congress to examine how to better increase the access to capital and credit for the construction industry.

It is also necessary we recruit young and talented workers through our apprenticeship training programs, which offer high-tech, high-skilled, high paying careers that come with rewarding pay, with full health benefits and a promise of retirement plans.

We hope that Congress will enact a comprehensive energy strategy that promotes the development on all available energy resources.

Thank you for this opportunity to testify in this very important hearing. NECA and VEC applauds the committee's efforts and we continue to offer our support to advance the

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committee's agenda and look forward to working with you in the future.

Thank you.

[The prepared statement of Rex Ferry follows:]

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Mr. Upton. Thank you, Mr. Ferry.

Mr. O'Sullivan, if you are ready. Right here. We were a little worried, you didn't take that water.

Mr. O'Sullivan. I am wearing a tie.

Mr. Upton. All right.

Mr. O'Sullivan. I am recovering from a cold, thanks.

Mr. Upton. All right. You are welcome.

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STATEMENT OF TERRY O'SULLIVAN

Mr. O'Sullivan. Chairman Upton, Ranking Member Rush, and members of the Subcommittee on Energy, on behalf of the 500,000 strong, proud, and united men and women of the Laborers' International Union of North America, I want to thank you for the opportunity to testify here today. It is both an honor and a privilege to do so.

As the people who build, repair, and maintain our nation's critical energy infrastructure, LIUNA members support a reasonable, rational, fact-based energy policy. We support regulatory reform that streamlines the permitting process, allows reviews by separate agencies and entities to proceed concurrently and provide for timely definitive decisions that enable approved projects to proceed without delay. This should be a bipartisan agenda to create millions of new jobs across many sectors of the economy, while modernizing our vital energy infrastructure and ensuring America's energy independence.

The American Society of Civil Engineers has given our energy infrastructure a grade of D plus, yet opposition to almost every energy project has threatened to derail all serious attempts to address this crisis. It also threatens

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the creation of good, middle class family-supporting jobs.

For workers in communities throughout the United States, pipeline projects are lifelines. Today, LIUNA has more than \$50 billion worth of pipeline work under contract. Tens of thousands of highly trained safe and skilled building trade members are being put to work for years to come as projects such as the Dakota Access pipeline that the President's Executive Order has allowed to move forward, the Atlantic Sunrise pipeline, the Rover pipeline, the Atlantic Coast pipeline, the Sabal Trail pipeline, and the PennEast pipeline. And these are just the tip of the iceberg.

Although these jobs, like all construction jobs, are temporary by nature, anyone who has a clue about the work we do knows that by stringing together one temporary job after a number, construction workers are able to provide for their families and save for retirement.

At a time when it is harder and harder to succeed without a college education and the debt that goes with it, LIUNA and other building trades unions are one of the few places where a high school graduate can enter an apprenticeship program, learn a trade, become a qualified journeyman and build a rewarding middle class career.

LIUNA does not deny climate change. In fact, we are one

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of the few unions and supported cap-and-trade legislation and that sought to build common ground with some environmental groups. But we became disillusioned, disenchanted, and disheartened as we watched many environmentalists abandon reason and oppose each and every pipeline project and the jobs they would create because they want to leave all oil and gas in the ground, which would leave many Americans in the cold, in the dark, and in the red from high energy prices. This keep it in the ground mentality ignores the reality that these resources continue to be pulled out of the ground anyway and transported by means that are riskier and less environmentally sound than the pipelines these groups loudly oppose.

Again and again over the past few years, some of these groups have misled legitimate regulatory processes to delay projects indefinitely and to needlessly repeat environmental reviews in the hopes that they will get the answer that they want. Frankly, it is not the pipelines that are dirty. It is the politics surrounding them. Keep it in the ground isn't a viable energy policy. It's an unreal, unattainable, uninformed slogan. It is time to embrace a comprehensive, rational, common sense energy policy.

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to our energy infrastructure problems isn't a Republican issue or a Democrat issue. It isn't a conservative issue or a liberal cause. It is an American issue.

Thank you for the opportunity to offer this testimony. I look forward to answering any questions you might have and to working with you in the future.

[The prepared statement of Terry O'Sullivan follows:]

*****INSERT 11*****

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Mr. Upton. Thank you very much.

Mr. Mahmoud, welcome.

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STATEMENT OF JOEY MAHMOUD

Mr. Mahmoud. Thank you. Thank you, Mr. Chairman, it is a pleasure to be here. My name is Joey Mahmoud, I am the Executive Vice President for Energy Transfer Partners.

Over the course of the last 6 months this project, and our company, have been subjected to a series of politically motivated actions by the previous administration, accompanied by a host of half-truths and misrepresentations in both social and mainstream media.

Dakota Access is a \$3.8 billion, privately funded pipeline project which, during the course of construction, has employed more than ten thousand skilled workers and unskilled workers. During its entire 1,172 mile journey from North Dakota to Patoka, Illinois, it does not cross a single inch of Tribal reservation or trust land and it only crosses a mere 1,094 feet of federal land.

During the greater than 2 and 1/2 year-long permitting process for the whole project, we and the Army Corps of Engineers reached out to and accommodated 55 different Native American Tribes or groups. Of these Tribes, the Standing Rock Tribe was the first Tribe we actually approached and gave a presentation to in September, 2014. It was clear from

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their response they had no interest in discussing the project with us. In addition to our efforts, the Army Corps reached out to the Tribe on nine separate occasions. Despite these efforts, the Standing Rock declined to participate in any meaningful way.

On July 25, 2016, the Army Corps brought to conclusion its two-year plus review of the project, issuing an environmental assessment approving, among other things, our application for a crossing of the Missouri River at the current location, as it sits today.

After declining to participate in any meaningful consultation, the Tribe, supported by Earthjustice, brought a legal action seeking to block the project.

On September 9, 2016, a federal judge issued a 58-page opinion rejecting the Tribe's request for a preliminary injunction and finding that the Tribe largely refused to engage in consultations.

However, within minutes of the judge's ruling the Departments of Justice, Interior, and the Army issued a joint statement indicating that, notwithstanding their successful defense of the permitting process in federal court, they were deciding to issue an easement at that time.

Perhaps the most prominent, and ill founded, of the

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misconceptions is that Dakota Access represents a threat to the Missouri River and those who rely on it for drinking water. Nothing could be further from the truth. Much of the oil from the Bakken is currently being transported across the Missouri River via truck and rail transportation, modes which, statistically, are far more likely to experience a spill than pipelines.

Perhaps even more, the greatest irony in a saga replete with ironies is that the Standing Rock have just relocated their Missouri River water intake more than 70 miles downstream from this pipeline. However, there is a rail crossing that crosses 1.6 miles from their new intake that moves hundreds of thousands of barrels per day.

Others have asserted the route chosen for the pipeline was indifferent to, and would disrupt, archeological sites of importance. Again, this is totally contrary to the facts.

Dakota Access employed dozens of cultural experts to work alongside State and Tribal cultural officials to ensure that nothing of cultural, historic, or sacred significance was disturbed. Based on these experts' findings, the project undertook 140 different route changes in North Dakota alone.

Indeed, the selection of the river crossing itself was largely driven by a desire to ensure the protection of

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cultural resources. The river crossing site for the Dakota Access pipeline is located in an existing utility corridor which already includes two pipelines, the Northern Border Natural Gas pipeline and a high-voltage electric transmission line, both built in 1982.

The easement, which has been the focus of so much public attention since this has occurred is a simple ministerial document which was part and parcel of the river crossing permit. The easement was arbitrarily withheld by the former Assistant Secretary of Civil Works and was not received until last week. We can only speculate as to her motivation, but what is abundantly clear is that the Department of the Interior, and most likely senior members of the White House staff, interfered deeply and inappropriately in the waning stages of the regulatory process.

What is also clear is that I and other senior representatives of my company sat in the Department of Justice, while representatives of that agency, the Army and the Department of Interior repeatedly made factual misrepresentations about the process and their intentions.

Finally, it is abundantly clear that notwithstanding the repeated public pronouncements that the Army Corps and Dakota Access had complied with all applicable requirements for

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construction of the pipeline, and notwithstanding two successful defenses of the permitting process in two federal courts, these agencies have made the political decision that they were not going to issue the permit or the easement at that time.

Mr. Chairman, we came to realize that even a company as large as Energy Transfer is helpless in the face of a government that will neither obey nor enforce the law. We came to realize that playing by the rules can count for little. And we came to realize that good faith efforts to accommodate with the many different stakeholders involved can be a fool's errand when political motivation overrides the law.

I suggest, and as I indicated, the easement withheld by the politically appointed Assistant Secretary was the sole remaining administrative step needed for completion of this project. This \$3.8 billion, 1,172-mile pipeline had already received all other necessary Federal, State and local permits, as well as all the rights-of-way necessary for completion of the project. All of this was accomplished over a two-year period.

I would respectfully submit that a project of this size does not receive those approvals in that time frame unless it

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places a heavy emphasis on cultural and social concerns, is sensitive to diversity and gives great deference to the environment.

With that, sir, I thank you for your time and I look forward to your questions.

[The prepared statement of Joey Mahmoud follows:]

*****INSERT 12*****

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Mr. Upton. Thank you. Thank you. Thanks all of you for your testimony.

So let me just say a couple of things. So as you all know, I am from Michigan. I am no stranger to controversies surrounding pipeline safety. I want to say one of my first bills when I when I first elected was establishing an oil spill response team from the Great Lakes, something that we did not have when I served on the Transportation Committee.

I would note that the rate of accidents has fallen significantly in recent years and we have seen more stringent federal regulations and closer oversight but there is, obviously, more work that has to be done.

I had a spill not too far from my district back in 2010 in the Kalamazoo River. I worked across the aisle with then-Chairman Dingell. This is the Dingell Room. Chairman Dingell was here to cut down on the time that it take to report a spill. The old rules were it had to be reported on a timely basis. In the case of the Kalamazoo River, it was days. It is now 24 hours without heavy fines.

So we have, in the last couple of years, we have actually done two reauthorizations of pipeline safety bills. Both bills passed out of this committee. We worked with the Transportation Committee. Overwhelmingly bipartisan. I want

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to say I don't think there was a single member that voted against that bill when it reached the floor. President Obama signed it into law, both of the bills. And I would note that we have a Line 5, which connects the upper peninsula with the lower peninsula. So, when you say you are from Michigan, make sure you put both hands up. But we had some special provisions from here. I had some special provisions that were added for safety and transparency available to the public.

So the bottom line is, this committee is not afraid to tackle this issue. We don't want any pipeline spills. And in the case of the Kalamazoo spill, a million gallons, it cost the pipeline company, Enbridge, a billion dollars to clean that up. So these are not the light issues.

Mr. Mahmoud, you talked about there are other alternatives to pipelines that include rail, they include truck. I think we know the answer but is there a safer, more economical way than a pipeline?

Mr. Mahmoud. Thank you. No, sir, there is not. Statistically pipes are significantly safer than other forms of transportation. Actually, the safest form of transportation of any mode of transportation are pipelines.

Mr. Upton. Mr. Harrison noted in his testimony that

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there were some secret documents, the words that you used, relating to safety. Can you expand on that?

Mr. Harrison. Real simply, during some of the meetings when we asked for that very transparency that some of these bills are pushing, we get met with words such as proprietary and confidential and we can only give you certain things. A pipeline of this nature, it would go a long ways to have that transparency up front. What are we dealing with? What are we trying to sign off on as individuals?

Mr. Upton. One of the things that was in the testimony from Mr. Mahmoud was that you did look at alternatives, right? You looked at a number of different alternative routes. Is that correct?

Mr. Mahmoud. Yes, sir.

Mr. Upton. And how many different routes did you look at?

Mr. Mahmoud. In the U.S. Army Corps of Engineers, there was one additional alternative route in addition to what is called the no action alternative. However, in preparation for the development of the project, my company looked at many, many alternative routes to connect the Bakken crude oil to Patoka, Illinois.

Under the environmental assessment for the U.S. Army

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Corps of Engineers, they are only required or looked at the crossing at Lake Oahe which, in this case, included the two alternatives which one being the route alternative and two being the no action.

Mr. Upton. Now, one of the things that I did, as we moved this legislation forward, it was called the Upton-Dingell bill, was when a pipeline goes underneath a major water source, a river, a lake, rather than the old days of simply what they called trenching it, laying the pipe down, putting cement bags or rocks on either side to bolster its security, they actually now, for major water sources, they actually bore underneath that water source. Is that what you are doing in Lake Oahu? Is it Oahu, is that how you say it?

Mr. Mahmoud. Lake Oahe.

Mr. Upton. Oahe.

Mr. Mahmoud. Yes, sir. And that is correct.

Mr. Upton. Is it correct that it is like 90 feet underneath? So you are doing exactly what we said in this committee when we passed the reform legislation that instead of trenching, you are actually going fairly deep underneath that water body. Is that correct?

Mr. Mahmoud. Yes, sir, that is correct, 90 to 115 feet.

Mr. Upton. All right, my time has expired.

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Let me yield to the ranking member of the subcommittee, my friend Bobby Rush from Illinois.

Mr. Rush. I want to thank you, Mr. Chairman. Mr. Chairman, I just want to say that I am always, most of my life I have always been a fighter for those who don't have a voice, those who are marginalized, those who have little respect. Instinctively, I am concerned about this issue, although, Mr. Chairman, I want to be open-minded on this because I am interested in how the energy sector in its entirety produces jobs for people in my district and similarly situated districts all across the Nation. So, this is a challenge for a lot of us who want respect, progress, jobs, economic viability. We also want to have environmentally sound policies and projects.

I have a question I am going to ask Mr. Harrison. First of all, Mr. Harrison, in your testimony you said that the Tribe does not philosophically or etiologically oppose economic development, energy independence, or protection of national security. But you oppose development that is unattainable without your consent that puts your people, your cultural sites, and your natural resources at risk.

Were you consulted at all during this decisionmaking process?

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Mr. Harrison. Just to clarify, were we consulted?

Mr. Rush. Yes.

Mr. Harrison. Not at the level that we feel that the law should provide or actually does provide.

A lot of the issues have centered around the words meaningful consultation. Attending a couple of public hearings does not fit that bill. And I just want to reiterate at the very meeting that Mr. Mahmoud mentioned in 2014, the Tribal Council adopted a resolution opposing this. That is the strongest statement that we can make, as a government, in opposition to this project.

At that point, there was little to no real consultation as to resolve that resolution or to address it. The project went forward and there were some attempts at some minor communication but consultation, no.

Mr. Rush. So when you say that they tried to ram this project down the throats, would you say that this company tried to ram this project down your throats without any respect or any real input, without any buy-in from you and your Tribe?

Mr. Harrison. I think this project was going to go forward whether we objected or not. And we feel that that should be addressed at the front end. There should be some

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consensus, some real input, which we did not have.

Mr. Rush. Mr. Mahmoud, would you answer the same question or respond to what he said? Did you all include them in at the various stages of decisionmaking that would satisfy their need for buy-in or input into this process?

Mr. Mahmoud. Thank you for the question. And yes, sir, I believe we did.

From the very beginning, as I mentioned, September of 2014, we gave our first presentation to the Standing Rock Sioux Tribe. From that time forward, we met with them or on occasion invited them to participate in seven different opportunities to have sit-down, very one-on-one dialogues to discuss their concerns, as well as any information that we could share regarding the routing, as well as the operation or design of the pipeline. And those requests for consultation were mostly denied.

We had some conversations with the Tribal chairman, who I respect greatly. But at the same time, we were not able to have meaningful consultation because of a lack of engagement.

Mr. Rush. I have one final, one follow-up.

Did you all attempt to get a third party involved in this at all, either the Tribe or the company? Did you all attempt to get a third party to referee, if you will, the

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discussions?

Mr. Mahmoud. Yes, sir, we did. We hired a Tribal liaison, who was a NEPA expert and an outreach specialist. She is actually an archeologist.

Mr. Rush. An independent third party, not somebody that you hired.

Mr. Mahmoud. Yes, sir an independent.

Mr. Rush. Thank you.

Mr. Upton. Thank you.

Mr. Walden.

The Chairman. Thank you very much, Mr. Chairman.

I have a question, Mr. Mahmoud, when you talk about NEPA, doesn't the Army Corps of Engineers have to follow a NEPA process?

Mr. Mahmoud. Yes, sir, they do.

The Chairman. And does that NEPA process require consultation with Tribes?

Mr. Mahmoud. Yes, sir, it does and they did.

The Chairman. And they did?

Mr. Mahmoud. Yes, sir.

The Chairman. All the Tribes?

Mr. Mahmoud. In the Northwest Region of the United States, they have a list of approximately, I think it is 55

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different Tribes. They did reach out to all 55 Tribes, a total of 389 different attempts or consultations with those 55 Tribes occurred as part of the NEPA process.

The Chairman. And did they listen to those Tribes? Did they make any changes as recommended through the NEPA process from the Tribes to the route of the pipeline or any conditions?

Mr. Mahmoud. Absolutely. On multiple occasions, we modified the route. In North Dakota, 140 different modifications. In particular, we made multiple alterations of the route, specifically as the result of consultations and surveys conducted in coordination with the Native American groups that participated.

The Chairman. And did the Native American groups also employ archeologists?

Mr. Mahmoud. I am sorry.

The Chairman. Did they employ archeologists as well?

Mr. Mahmoud. Yes, sir, they did.

The Chairman. To identify any sacred grounds, any of those sorts of issues, right?

Mr. Mahmoud. They provided their cultural and heritage specialists and some of those may or may not have been archeologists by training.

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The Chairman. I understand.

Mr. Mahmoud. Yes, sir, they did.

The Chairman. Okay, fine. Thank you.

Mr. O'Sullivan, I know I support the Keystone pipeline. We voted on it here. It had 60 plus, I think, as I recall, additional safety requirements above and beyond the underlying American pipeline safety laws.

When I went home, I had Democrats and others attack me because these weren't real jobs because they were temporary jobs. I would like to get your view on that because I hope that like if I build a house, which I have never done, but if I did, I would want it to be temporary in the sense I would want you to finish. But aren't those jobs kind of valuable? Isn't that what your folks do is a whole bunch of temporary jobs that make up for full-time family wage jobs with great benefits?

Mr. O'Sullivan. Absolutely, Congressman. And I want to thank you, personally, for your support on Keystone pipeline.

In my testimony I talk about these are good middle class family-supporting jobs.

The Chairman. What would the annual salary be, on average?

Mr. O'Sullivan. On a pipeline job, it depends on where

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it is at because that is the wage would depend on it. But isn't anything for member of my union to make \$70,000 or over \$100,000 on a pipeline project.

The Chairman. And do they get health insurance and retirement, things of that nature?

Mr. O'Sullivan. They get health insurance and they do get retirement security through a defined benefit pension plan.

So, there are some of the best jobs, those heavy in the highway sector, that we have in our entire organization.

The Chairman. Thank you.

Now, Mr. Mahmoud, the pipeline itself, are you going to pay any property taxes? Is anything going to local communities?

Mr. Mahmoud. Yes, sir.

The Chairman. How much?

Mr. Mahmoud. Millions of dollars. In North Dakota, \$13.1 million. In South Dakota --

The Chairman. Is that just a one-time payment?

Mr. Mahmoud. It is an annual payment. So every year from now and for as long as that pipeline exists in the ground as property, it is taxed as real property.

The Chairman. So how much a year?

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Mr. Mahmoud. The valuations are done by the State taxing authority. But in year one, I will give you the stats: \$13.1 million for North Dakota, \$13.5 million for South Dakota, \$27.4 million in Iowa, and \$750,000 in Illinois.

The Chairman. So would I be right to assume that it would be somewhere in that range going forward per year?

Mr. Mahmoud. That is a reasonable estimate, yes, sir.

The Chairman. All right, I am going to yield now to the gentleman from North Dakota, Mr. Cramer, the balance of my time, Mr. Chair.

Mr. Cramer. Thank you, Mr. Chairman and thanks to all of you for being here. A special welcome to Mr. Harrison, my constituent and Mr. Mahmoud, my newest corporate citizen. It is great to have you all here.

I am going to start out by letting you know I was on the Public Service Commission in North Dakota for nearly 10 years. I carried the pipeline portfolio. I sited the original Keystone pipeline through North Dakota, through 600 landowners' land, nine counties, and they are very grateful, those rural counties for that property tax relief that is offered.

Before I run out of time I will tell you that my

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intention going forward as I get to questions will be to dig in a little bit, Mr. Harrison and Mr. Mahmoud, on the consultation process, both as it has happened in this case and probably as important as anything, Mr. Harrison, going forward, if in fact we can improve some of those things.

But I am also going to offer into the record some very specific documents, including Judge Boasberg's ruling from last fall, Colonel Henderson's memo of record on December third, one day prior to the Acting Secretary of the Army for Civil Works changing that memo, at least the conclusions of that memo. So, with time running out, I will yield out and those are the areas of exploration I want to go down.

Mr. Upton. The gentleman from Oregon's time has expired.

The chair recognizes the gentleman from Texas, Mr. Green.

Mr. Green. Thank you, Mr. Chairman. And I want to thank our panel for being here. Normally, we don't have two panels in a day but I appreciate you all's patience.

First, Mr. President, I appreciate your being here. I have a great Laborers' Local in Houston that I work with all the time. You stated that the Dakota Access pipeline would put about a thousand laborers back to work and I see some of

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the orange shirts. Thank you all for being here.

You mentioned it and I have heard it that these jobs are temporary jobs, unlike refineries and chemical plants for my steel workers. They go there every day. But laborers literally in all of our building trades, they work on a project and then they may go down the road or go across the country the next day. So even though they are temporary jobs but if you do that -- and where I come from we have lots of pipelines and we need to keep making them better. So but you mentioned about the temporary jobs. You could probably explain it better than I can these jobs are site temporary but they are full-time jobs that are created.

Mr. O'Sullivan. And thank you for your support, Congressman.

At the end of the day, we pride ourselves because we are builders. So we build pipelines, we build buildings, we build highways and bridges. And when that project is over, we move on to the next one.

So it is nothing for a member of my organization to have five or six different jobs in a year. Some of them may work on one job for multiple years but ideally -- not ideally but regularly what happens is that we move from project to project. We like longer term projects better than shorter

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term projects but, at the end of the day, that is the nature of the construction industry. And as I said in my testimony, we cobble together a temporary job after temporary job and create a construction career for those that we proudly represent and the building trades men and women as well.

Mr. Rush. The Dakota Access pipeline you said was a thousand laborers working. How many man-hours would a pipeline project like that create?

Mr. O'Sullivan. It would be millions. Congressman, I could get that for you. There was 4,500 building tradesmen and women that were also -- so, there was a total of 4,500 union building tradesmen and women; 1,100 of them were laborers.

Mr. Rush. What type of workforce programs do you have or development programs that -- I know you have an apprenticeship program. I went through a 4-year apprenticeship as a printer but I couldn't print the newspaper today. But could you also partners with local community colleges for training in your apprenticeship programs?

Mr. O'Sullivan. In many instances, we do, Congressman, in various places across the country. As an organization, we train almost 200,000 laborers a year and over 100 different

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environmental and construction skills training programs. We spend \$145 million of our own money training, upgrade training, apprenticeship training, the skills and abilities of those that we proudly represent. I believe it is one of the things that we do best and serves as the cornerstone of our organization is our ability to provide that quality training to keep up with new technologies to make sure that our members have the diverse skills so that they can have a career as a construction laborer.

Mr. Rush. Thank you, Mr. Chairman. I yield back my time.

Mr. Upton. Thank you. Did you want a minute of his time? Well, there is a minute left.

Mr. Rush. Mr. Sullivan, congratulations on our outstanding work. Laborers are a very important part of the Chicago workforce. My question to you is what about diversity among your members, diversity among your labor force, diversity among those who will be employed on this pipeline? Can you answer the question of diversity of workforce with the tens of thousands of people that you have trained and have been employed by your union?

Mr. O'Sullivan. So, Congressman, I could answer it in a general sense because we have about 350 local union offices

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across the United States and Canada but the diversity of the community is usually very reflective of the diversity of our local unions and our membership.

And we are a very diverse organization. Now, if you go to Montana or other places, we would reflect the diversity there. But if we go to Chicago or if we go to New York, we go to California, usually, the diversity of the community is going to reflect the diversity of our organization.

Mr. Rush. How diverse was your workforce on this pipeline?

Mr. O'Sullivan. On the Dakota Access?

Mr. Rush. Yes.

Mr. O'Sullivan. I could get you that information. I don't have it at my fingertips, Congressman, but I would be happy to get it.

Mr. Upton. The gentleman's time has expired. Thank you. Thank you for getting that information to us. We will look forward to seeing it all.

Vice chairman of the subcommittee, Mr. Olson, from Texas.

Mr. Olson. I thank the chair and a big Texas howdy and welcome to Mr. Harrison, Mr. Ferry, Mr. O'Sullivan, and Mr. Mahmoud.

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And a special howdy for Ms. Kann. You mentioned your friend named John, who served our Marine Corps. Is that correct? Was that his first name, John? I served in our Navy. So, please thank John for his service. And please remind him that he is within the Department of the Navy as a Marine. He will love you for it.

Voice. The men's department.

Mr. Olson. I am an optimist. As I said in my opening statement, we have to find a balance between jobs and growth and historic lands. If it is all black and white, nobody wins; we all lose.

And as I mentioned in my opening statement, I have got a great example back home in Sugar Land, Texas, a park for our veterans that kids go fishing in, have barbeques in, fly kites on. It is all on top of a natural gas pipeline. It has been that way for 10 years. Sugar Land found a balance and surely, North Dakota can find a balance. We can't seek perfection.

Mr. Mahmoud, you know we lost perfection the day Eve bit that apple. It has never happened since then. Nothing made by men is perfect. So please tell us, with that said, can you talk about some of the safety advances we have seen, what is going on with the pipeline right now to make it the safest

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pipeline ever?

Mr. Mahmoud. Yes, sir and I appreciate that because this pipeline, by the pure fact that it is being built today, is safer than a pipeline that was built in the 1950s. The technology has improved. The steel that is used is higher quality. The formulas are better suited in our design to withstand the different forces that the earth puts on it on a daily basis, as well as the preventative steps that we take to ensure safety because that is our number one goal. Safety is always our number one goal. When we designed and we build a pipeline and we place it in these diverse communities, that is the number one thing we think about. So we always design to the latest standards and, most often, we go above and beyond.

So we use things such as automated valves. It is probably one of the greater technologies that a lot of pipeline companies and including Energy Transfer that we put in place so that you don't have to rely upon a field operator to go close that valve but then you can actuate that valve remotely. So there is a lot of technologies that we employ above and beyond.

[Simultaneous speaking]

Mr. Olson. -- shut off manually?

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Mr. Mahmoud. That is a complicated question. For oil pipelines, it doesn't quite work that way but for a natural gas pipeline it absolutely works that way.

Mr. Olson. Sorry for the confusion.

My final question is there for Mr. O'Sullivan and Mr. Ferry. One thing that divides us on this issue is a lack of pipeline certainty. Right now because FERC does not have a forum, nothing is moving from FERC. So please tell us, beyond that, and even beyond pipelines, can you talk about how important it is for project certainty when it comes to attracting and keeping skilled labor?

Mr. O'Sullivan, Mr. Ferry, whoever is up first.

Mr. O'Sullivan. Congressman, it is critically important. When I talk about and I know this committee has about the approval process, I mean in many instances, as we work with community colleges where we are training to need is that you don't want to train somebody and then they don't have a job for 6, or, 8, or 9 months, they feel as though they have been let down. So that training is absolutely critical and particularly as Joey was talking about, new technologies and things like that we try and keep our members and our apprentices up to speed on all of that.

And so if we could cut down, without cutting any

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corners, I am certainly not suggesting that, that every stakeholder should be heard, that it should be a fair but there should be a beginning and an end. And that gives the kind of certainty to ramp up training, to ramp for jobs.

Mr. Olson. Mr. Ferry, do you care to comment on that, sir?

Mr. Ferry. Yes, sir. Just to help everybody understanding, I will give you a little metaphor. When I went to work in the trade, I went to work every day to work myself out of a job. That is the type of temporary construction we are talking here. So we build buildings and when the building is done, we move on.

So to support what Mr. O'Sullivan is saying right here, yes, we go to work every day to work ourselves out but it is the training. It is the safety. It is all that.

We are doing the ETC Rover pipeline with ETC in Ohio right now. And I will tell you, everything is marched to the drawings, to the specifications. There are certifications we have to follow. There is testing procedures we have to follow and it is all done with the whole intent of safety, of going to work every day to make sure my workers come home safe but to make sure every day the product is completed and it is safe for the community.

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Mr. Olson. Thank you. My time has expired. I yield back.

Mr. Upton. I like that answer because Rover is coming to Michigan and we are going to need it. It is going to impact my district, I know.

Mr. Welch is recognized for 5 minutes.

Mr. Welch. Thank you very much. I want to thank the panel.

A couple of things. One, the big issue about the pipeline is not so much the pipeline, the big issue about where it goes and how it affects folks there, and it is not about the jobs. Mr. O'Sullivan, you have a fantastic union and fantastic workforce. And if I have my way, we are going to put them together rebuilding America with a big infrastructure bill. I mean we need to get them doing the work. So I just want to thank you.

And also, Mr. Walden made the point we get it that if you are in construction, by definition, those are temporary jobs. So see the union folks here. Thanks for being willing to do the work where it needs to be done. That means spending time away from your family. That is hard.

The other thing I think we understand is that America has a lot of work that needs to be done. There is a lot of

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jobs. We have got low unemployment. There is not a lot of good paying jobs. And the challenge for us is more the paycheck than it is actually the job. And anything we can do to maintain those jobs, we should.

But there is another issue that hasn't really been discussed here that is important to a lot of us that is not about the union and it is not even about the location of where this pipeline goes. And that is, obviously, of enormous importance to the Tribal peoples and that is the whole climate change issue and how we get our energy. And that is a point of enormous contentious debate here in Congress about what should be our policy to try to move to less carbon-intensive forms of energy.

And I feel as though in the pipeline a lot of really good people, including these workers here, get caught in the crossfire. But that is an issue that we are not going to resolve here but where there is a lot of things that we can do that would achieve or move us toward the goal that I have of less carbon in the atmosphere that would involve good jobs for folks in your union.

You know the energy efficiency stuff that we have been working on, Mr. Chairman, that requires skilled workers to retrofit places and it requires real skills. And I hope we

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find an ability to work on the common ground so that we are going to pay some respect to these workers.

I do want to ask Mr. Harrison, I know for you this whole situation is in not just your backyard, it is in your yard. And I think all of us should have the capacity for some awareness that if it were our yard, we would have a passion about protecting our historical cultural rights.

Just tell me about your interaction with the pipeline folks and whether there was an effort to have you -- you made an effort to try to locate the pipeline away from places that would encroach on important issues for you.

Mr. Harrison. Thank you for pointing that out, Congressman. We often have to put it in that perspective that if the shoe were on the other foot, how would you react. So, I appreciate that.

One of the elements that we have consistently tried to say in our opposition is that much of the pipeline and the risk, and there is a risk, as the Congressman and vice chairman said. There is always a risk but we bear the greatest risk. How is that shared with the rest of the state? How is it shared with the rest of that?

We are approximately, well I should say we are about 20 miles, a little over 20 miles from the South Dakota border,

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so we are at the southernmost edge of North Dakota and before the Missouri hits South Dakota. In the State of South Dakota, we are going to bear the greatest risk.

I would also submit, and this goes right to the point of how does it affect us, I would also submit this that we also bear the least benefit. And whenever if this oil starts to pump through the pipeline, I can submit that a year from there, I would wager that our county, Sioux County, which is also part of North Dakota, would have the smallest tax revenue from it. We have no workers on this pipeline and we are right there.

So, the benefits of this, these economic development portion of it, the economics behind it, don't benefit us but yet we bear the greatest risk. We have been opposed on many of those platforms.

Mr. Welch. Thank you.

Mr. Upton. The gentleman's time has expired.

The chair will recognize the gentleman from Illinois, Mr. Shimkus.

Mr. Shimkus. Thank you, Mr. Chairman. It is great to have you all here.

It is always great to talk about jobs, the economy, and energy security. I believe in pipelines. I believe they are

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the safest, most reliable, cheapest way to move bulk, liquid crude. Undeniable.

So, having said that, I want to put up, Mr. Mahmoud, this pipeline that you are speaking of ends up here?

Mr. Mahmoud. Patoka, around Vernon.

Mr. Shimkus. Patoka is in my district. I have been to the Patoka Tank Farm numerous times. It is one of our pride and joys.

And so the two pictures that everybody can see is the one on the left is our pipeline system in our country right today. Sometimes what has happened in this debate, because of the PR is that the country thinks that there is only one pipeline being built and we are only operating one pipeline. But there is, obviously, thousands and thousands of miles of pipeline and hundreds of pipelines that go across the transcontinental line.

So if we were debating the other pipeline controversy of a Keystone XL, you would think that we had never had a pipeline go across a country boundary. But as the map shows, we have got gazillions. No, no, go back to that.

So, the red is crude oil refined product, the blue is natural gas. And again, the right one is the big red dot, that is Patoka. So you can see in my congressional district,

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one, two, three, four, five, six, seven, eight crude oil refined pipelines and look at all the blue ones, which is the natural gas. So, let's go to the next slide.

So I also deal with this weekend I leave for Brussels. I am a member of the NATO Parliamentary Assembly. NATO is also a big new story today. Russia has used energy extortion to our allies.

So this picture tells another story. The ship on the right is actually an LNG import terminal in Lithuania called Independence, aptly named because it is the hope of our allies that as we build these pipelines and we move them to the east coast, and then we build LNG terminals, compress it, put it on ships, that they are no longer extorted by Russian natural gas or Russian crude oil. They are our allies. They are our friends. They fought together in Afghanistan with us. They fought together in Iraq with us. And that is critical.

Now the other ship on the left is just an LNG terminal ship delivering LNG to independence.

Now, why do I weave this story? So a lot of people will say there is no economic benefit. There is huge economic benefit. If we are putting natural gas on the world market, it dramatically increases our balance of trade. It makes us

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a stronger nation. It makes communities stronger. There are 30 applications for LNG terminals pending. I don't think they will all get built. To build an LNG terminal is about \$10 billion. And that is good jobs, good wages, good benefits.

And not only that, I always talk about the tax benefit to these communities. I have rural America. I have high-powered transmission lines. And I have some of my community folks that don't like them. But when they go to the power plant in that community that has the power plant, has the tax base to fund its schools and it has the tax base to do its county, we lose the focus of the benefits of energy when we have this narrow focus and we don't look at how it is benefiting the whole country.

So I am all in on the bet that it is the safest, most reliable, cheapest way to move it. I am in it that it creates job. And I just want my colleagues here to understand the additional benefits that are happening not just in our country but to our friends and allies in Europe.

And with that, Mr. Chairman, no questions. I yield back.

Mr. Upton. The gentleman yields back.

The chair recognizes the ranking member of the full

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committee, Mr. Pallone for 5 minutes.

Mr. Pallone. Thank you, Mr. Chairman.

I wanted to get one question in to Councilman Harrison and one to Ms. Kann. So, I will try to use my time wisely here.

In my opening statement I mentioned that most of the problems with pipeline construction result from disputes over the siting of these lines. Streamlining will solve this problem for the developers of the project but at the expense, often, of people and resources along the project pathway.

So Councilman Harrison, in your testimony, you point out that consultation with Tribes doesn't just mean telling landowners and communities what you are going to do and how you are going to do it. It means listening to community concerns and making necessary changes to ensure these projects do not harm people, land, and other resources.

Mr. Mahmoud said that Energy Transfer Partners negotiated with and accommodated 55 Native American groups and that only the Sioux Nation has been unwilling to talk with or work with them. I just wanted your response to that. When did the company first approach the Tribe about the proposed pipeline and the proposed route near your Tribe's water supply? What offers, if any, did the company make to

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alter the route or design the project in response to your concerns?

Mr. Harrison. Thank you for the question. I want to back up just a hair. The map that was up that showed all the pipelines, if you notice right above the North Dakota-South Dakota, there is a big hole where there are no pipelines. And that is treaty lands. The Native American treaties have been assigned that from the mid-1800s on and that is a large portion of that.

So to your question, how do these pipelines affect people and their resources, that is a good example. You start cutting through there without the proper consultation, now we are cracking the seal on something else, which is infringement on treaty rights. And that, my contract with the Government of the United States is something we take very seriously.

Now, to answer your question about when they approached us, September of 2014 is the initial time. At that time, we adopted a resolution, as a Tribe, opposing this project. From that, we don't feel that any of the meaningful consultation about the -- not just the objection but any kind of meaningful reroute was not taken seriously.

Now, there may have been some rerouting to the tune of a

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few feet or maybe a dozen feet here and there to avoid a little site, but there has never been a real conversation about let's look at some place else to cross that river.

Mr. Pallone. All right, thank you.

And then I wanted to ask Ms. Kann, in your testimony, you seemed to indicate that you come from a pretty conservative, predominately Republican area. In fact, I think that area went pretty strongly for President Trump. Mr. Chairman, I am glad I am not running there. It doesn't seem like you come from an area that is part of the keep it in the ground or anti-fossil fuels movement. In fact, you go so far as to say regarding your community that, and I quote, we get that sometimes land needs to be taken for the benefit of the community.

So am I right in my assumption about the Republican conservative nature of your area?

Ms. Kann. Can you say the last part of that for me again?

Mr. Pallone. Well, in other words, I am just trying to point out that your area is pretty conservative, predominately Republican.

Ms. Kann. Oh, it is strongly Republican.

Mr. Pallone. All right.

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Ms. Kann. You know as people speak up with regard to this issue, they almost feel like they are kind of not in keeping with their Republican roots. But then the issue becomes the rights of individual landowners and the actual protection under the Bill of Rights which is probably the most important protection that either party provides their constituents.

Mr. Pallone. All right. Well, let me get to my questions, I have only got a minute left.

I just found it interesting in your testimony when you say the citizens are no longer willing to tolerate the abuse of eminent domain to line the pockets of others. Because many in the gas line industry would argue that eminent domain is only used as a last resort and almost never involves seizure of private property and that they are constantly adjusting routes to minimize the impact on land owners.

But what is your experience? Do you feel like your concerns were listened to and there was a good faith effort to reach an accommodation with you and your neighbors to avoid eminent domain? Do you feel like there should be an eminent domain reform for natural gas pipelines that perhaps there should be a higher standard for a gas company to take land?

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Ms. Kann. Absolutely. And to maybe start at the end of your questioning and work backwards, the standard that seems to bring the most angst to my community is the division between the intent of natural gas for domestic use to meet the needs of our communities, to keep our schools warm, our factories running, our homes lit, and the intent of resources to be used for corporate profit. And we have felt that the standard should be different for the two. We are much more open and accepting of the idea of eminent domain when you are talking about upgrading electrical grids and supplying local power plants than we are about gas, in particular, that is specifically slated for export.

That difference is huge. That difference is the difference between what is protected by the Bill of Rights and what is not. That difference is part of what is spoken to repeatedly in the Republican platform of 2016 of protecting individual land owner rights as a sacred compact between our government and our citizens.

Mr. Pallone. All right, thank you so much.

Thank you, Mr. Chairman.

Mr. Upton. Thank you, Mr. Pallone.

The chair will recognize Mr. Barton.

Mr. Barton. Thank you, Mr. Chairman.

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My first question is to Mr. Mahmoud. Is that the way you say it? You are an employee of the Dakota Access pipeline. Is that correct?

Mr. Mahmoud. I am an employee of Energy Transfer Partners, which is the managing partner in the joint venture. Yes, sir.

Mr. Barton. I am told that this particular pipeline, if built, would go through an existing right-of-way. Is that correct?

Mr. Mahmoud. Yes, sir, part of it does.

Mr. Barton. Part of it does.

Mr. Mahmoud. Yes, sir.

Mr. Barton. Does the part of it that is under debate go through an existing right-of-way, the one that seems to be the most controversial?

Mr. Mahmoud. At Lake Oahe, there are two existing natural gas pipelines for the same system called Northern Border that we parallel, two existing 42-inch pipes.

Mr. Barton. Okay, so there is already pipelines there. Is that correct?

Mr. Mahmoud. Yes, sir, two of them.

Mr. Barton. I am also told by my staff that this particular pipeline has complied with every State and Federal

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environmental review and all the various permitting requirements. Is that correct?

Mr. Mahmoud. That is correct. We have permits from each state, every jurisdiction, local, state, as well as federal.

Mr. Barton. Okay, so there is not any existing hold up in terms of an agency of the Federal or State government that says no.

Mr. Mahmoud. That is correct.

Mr. Barton. Okay. What is the issue with the Indian Tribe or Tribes that seems to be controversial in their mind?

Mr. Mahmoud. You know it stems back to the consultation. And I cannot speak for the Government but what I can say is that the meaningful consultation that we have mentioned today, as a private company, we are not a Government. And so therefore resides the issue is that the Tribe, although we attempted seven different times and actually more than that, but seven official times, to have consultation and the Corps did it nine times, so that is 16 attempts with the Standing Rock. We don't have the government-to-government relationship that the Tribe was seeking to have that consultation. So there lies the issue is that we cannot enter into formal consultation with the

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Tribe to resolve some of the issues that they claimed and, therefore, it is the Government that has to have those consultations.

Mr. Barton. Well you could, but you can't force them. Isn't that correct?

Mr. Mahmoud. Well under government-to-government consultation, by definition, we are not a government. So therefore, we don't have consultation other than informal consultation, which we did do and we attempted to have very meaningful.

Mr. Barton. But under State and Federal law, you don't have the right to consult with an Indian Tribe because you are not a government. Is that correct?

Voice. Yes, thank you very much! You don't have a treaty. You are not --

Mr. Barton. I am asking the question to him, not to you. I am just trying to understand it. I am not trying to be adversarial or controversial. I just wanted the basic facts.

Mr. Mahmoud. That is correct, sir. We have the right to communicate with anyone as a U.S. citizen and I think we do that very well. Communicating with the Native American community is something that we hold very near and dear to our

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heart. We treat all stakeholders with the utmost respect.

But when it comes to the official process, under the permitting that we have to go through, we do not qualify to be a government to enter into government-to-government consultation.

Mr. Barton. My time is about to expire. I don't necessarily have a question for Ms. -- is it Kann? Is that the right term?

Ms. Kann. It is Kann.

Mr. Barton. Pronunciation, Ms. Kann.

Both my family farms were taken by eminent domain. So, I have a high-speed project going through my congressional district that a lot of my constituents opposed. So, I have great respect for individuals who are having to give some of their right-of-way by an eminent domain process.

As I understand it, you have said in answer to questions and in your comments that this particular project because, as you put it, is for-profit is objectionable. But if it were used for domestic purposes or if it were used for a product in or near your home, you wouldn't be opposed.

I said I wasn't going to ask you a question but is that correct?

Ms. Kann. I believe the members of my community who

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are most opposed to this would be less opposed and more willing to consider it as a viable option and not a violation of their rights as citizens, if that were the case.

Mr. Barton. But your property is not affected by the Dakota Access pipeline.

Ms. Kann. No. No, sir. It is the Atlantic Sunrise pipeline.

Mr. Barton. Thank you, Mr. Chairman.

Mr. Upton. Thank you.

Mr. Tonko.

Mr. Tonko. Thank you, Mr. Chair and let me welcome all of our members of the panel. Thank you for your input.

My effort here, or I think our effort should be to strike balance where there is opportunity with comprehensive energy plan to grow significant jobs that pay well and respond to all of the energy needs. And I understand fully that expression coming from our union force -- union labor force but there does have to be that balance.

And Ms. Kann, I thank you for being here today to speak up for many private property owners that often feel left out of the process. How long have you owned your property?

Ms. Kann. The property has been in my family since 1990.

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Mr. Tonko. And can you describe the process of dealing with the company, the pipeline company as they work to site its project and obtain permits?

Ms. Kann. The pipeline company, characterizing their behavior, the best word that I can think of is bully. They have shown up on-site with demands. They have left messages on my answering machine indicating that if they can have access to my property, their goal is to move it from my property, which I knew was not something that was within the power of the land agent speaking to me to do.

There was, at one time, a very important need to gain access to as many properties as possible for the purpose of surveying and many people in my community were treated in a way that was very disingenuous and very misleading, and very preying upon the lack of understanding that the people in the community had.

Mr. Tonko. And do you sense that they heard your concerns and worked with you to resolve any issues from the beginning of the process?

Ms. Kann. Absolutely at no point.

Mr. Tonko. Well this subcommittee considered legislation last year that would have allowed companies to use areal surveying done by drones to obtain surveying data.

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This could allow companies to get the data that they need, while doing minimal outreach to property owners.

Now, while I do not expect you to know the details of this legislation, based on your experience, do you have any thoughts on changing the permitting process that would allow pipeline companies to do less community outreach and engagement with private property owners?

Ms. Kann. I can't imagine anything more objectionable than not having to deal with the people that are directly affected by this. If anything, individual property owners need to have a larger voice in this and I think we need to redefine the concept of voice. Being invited to FERC hearings and being allowed to testify and have testimony on the record does not equate to being involved in meaningful dialogue that affects any kind of influence on a project like this. It doesn't serve to educate anybody and it doesn't serve to allow anybody to have input.

To end run the obligation of energy companies that want to do projects like this and not require them to engage with the communities that they intend to go through, I believe would be a horrific violation of our rights as citizens and landowners.

Mr. Tonko. Well, I tend to agree that these procedures

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that process needs to include respect and transparency and that means respecting the communities that host pipelines, inheriting all of the risks and none of the benefits. And respecting Tribal rights and property right, private property owner rights should be obvious. But sadly, the process has tilted the way from the public dialogue necessary to determine whether these projects are justified and how they will seek to minimize the damage to aggrieved parties.

I also want to point out that there have been officials that, despite supporting high profile pipeline projects have opposed interstate high-voltage direct current transmission projects, energy infrastructure projects that even many members of the environmental community support.

So while I, too, have my concerns about potentially cutting States out of the process, these projects will bring clean energy from America's heartland to the rest of the country. Instead of exploring yesterday's fuel supply to foreign countries tomorrow, let's work on getting tomorrow's domestic electricity to Americans today.

I would just ask for consistency in how we evaluate these projects. For me, that means ensuring a robust community-oriented process that respects landowner and Tribal rights, regardless of the type of infrastructure in question.

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I hope those same standards can be applied by everyone, whether it is a pipeline benefitting the oil industry or a transmission line benefitting utility scale clean energy.

I have a few seconds remaining and I will yield those to Mr. Rush, please.

Mr. Rush. Thank you.

Mr. O'Sullivan, I have just got to come back to the same line of questioning that I had for you before.

First of all, I am a strong union supporter. I am very close to the local in Chicago and I have a lot of admiration for the Laborers'. But I just can't settle in my mind you made a statement. You said that you move from community to community and, therefore, you reflect the demographics of that community. But you also said that these are temporary jobs and the way that these jobs becomes permanent is that you string together jobs. That gives a picture of a team of people going from one job to another, from one state, one community to another, and they become the workforce. I don't see that. I have a problem how can at one time reflect the demographics of a standing community and then also moving people in and out of your jobs who may or may not be from that community. How do you know that?

Mr. O'Sullivan. Congressman, you have always been a

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strong supporter of organized labor and we certainly appreciate that.

By that I mean this. If we take ETP's job, it is 1,100 miles. And so we will have to do it by 100-mile spreads. So I will have laborers and the other trades will have members that work within that 100-mile spread. And then I will have a group of other laborers that will work on the next 100. Sometimes we will cross over but what happens is is that when somebody gets out of that particular pipeline job, they will go back and they may be working on building construction or heavy and highway construction out of their local union hall after that particular job. Sometimes they stay with the company but most of the time when that particular spread is over, they will go back to the local union hall and then get dispatched out, maybe on another pipeline job, but possibly -

And what we do, Congressman is go through training. And so somebody that doesn't have training that is a pipeline laborer, we put him through training so that we give him the skill sets to be able to do building construction, heavy, and highway construction.

Mr. Rush. I yield back.

Mr. Upton. Thank you. The gentleman's time has

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expired.

The chair will recognize Dr. Murphy.

Mr. Murphy. Thank you very much.

Mr. O'Sullivan, I want to follow-up with what you just said there.

So, in terms of work of being a laborer, or an electrical worker, or a carpenter, or anything else, I guess in some ways all work is somewhat temporary in terms of a particular project. But it is long-term in terms of they are involved in multiple projects, correct?

Mr. O'Sullivan. Correct, Congressman.

Mr. Murphy. So how long will it take one of your workers, for example, on one of those 100-mile stretches?

Mr. O'Sullivan. It depends on the project and the terrain but I believe that Dakota Access, the time line was for 7 months or somewhere in that neighborhood to complete that 1,100 mile section of pipeline. Some are a little more complicated, more compressor stations. And I don't want to get into the intricacies of it. Joey has forgotten more than I know about it. But at the end of the day, those spreads, when they are over, it could be anywhere from 2 months to 7 months, depending on the particular project, or longer.

Mr. Murphy. Well, that is the nature of all

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construction work --

Mr. O'Sullivan. Absolutely.

Mr. Murphy. -- unless it is a multi-year project.

May I remind my colleagues, we are temp employees. We only have a two-year contract. We have to go back to our boss every couple of years and ask for a renewal on the contract. We don't have tenure. We are not permanent employees here.

I want to ask a question, Mr. Mahmoud, on the safety issue. I was a private sponsor a few years ago of a bill called Mark and Chelsea's Law, which included a comprehensive pipeline safety bill to keep families safe from ruptures from gas lines. And it basically said that if a utility worker, construction worker, anybody, punctures or ruptures a gas line, they have to notify the owners of that gas line and local emergency responders immediately on that.

Let me expand that to other areas of safety. In terms of during the construction, or inspection of what is in place, or response if there is a problem, can you give me an idea of what has happened over the years here, what is currently in place in terms of what you have to adhere to in terms of doing these projects to assure public safety?

Mr. Mahmoud. Thank you for that. There is multiple

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levels of safety, number one. And safety is always our number one criteria. Putting aside operational safety, if we are looking at construction safety, one, we are bound by the rules under OSHA for all of the workers that are employed not only by LIUNA, or some of the other trades, or the contractors, but also for Energy Transfer, or whomever they may work for.

So we comply with those laws and regulations but we also employ a very robust construction safety program that is executed by our contractors, primarily, but it is driven by our company to make sure that the culture of safety is pushed down to all the different layers so everybody behaves and acts in a safe manner.

Mr. Murphy. Some are federal, some are state, some are other local safety issues you have to be adhering to at all times?

Mr. Mahmoud. Yes, sir, that is correct.

Mr. Murphy. What if a local citizen has a concern about safety or risk factors, are you required to respond to that?

Mr. Mahmoud. We are. And typically, on a gas pipeline for an interstate pipeline, when those concerns are raised, they usually are raised as part of the NEPA process through FERC. And we address those through that environmental

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document or through data requests from that federal agency.

If it is not a federalized project, we do, we have a very robust outreach program that we educate the public, as well as other individuals that may live by or near, the 811 programs that you may be familiar with. So we have a very robust, very --

Mr. Murphy. And I guess this also goes to Mr. Sullivan. Are the workers on the project empowered also that if they see a problem, they report it right away?

Mr. Mahmoud. Absolutely.

Mr. Murphy. Mr. O'Sullivan is that true in terms of your workers and their training to report something immediately if they see a problem?

Mr. O'Sullivan. Absolutely, Congressman.

Mr. Murphy. And I just think it is always extremely important to have someone who can pull the whistle or something and say there is a problem, we have to act on it. And the responsiveness then within the construction is --

Mr. Mahmoud. Immediate. There is no delay. If there is a safety-related incident, it is addressed right then.

Mr. Murphy. Okay. Finally, I only have about 30 seconds left here, but back to Mr. O'Sullivan.

Expand this some more, labor's role, a seat at the table

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in terms of the regulatory process. Do you play a role in that? Does labor play a role in that?

Mr. O'Sullivan. We do, Congressman. What we do is we find our members that are along the pipeline route. We encourage them to show up at the town hall meetings and public hearings that are going on all along the whole pipeline.

So we do engage because they are residents of the community as well. So, they do show up at the town hall meetings and public listening sessions.

Mr. Murphy. Let me just add one final comment with regard to what you said before about whether someone is working 2 months or 7 months and multiple jobs put together may not seem like much, if someone is on the outside looking in, but I am sure it means a lot to that worker --

Mr. O'Sullivan. Absolutely.

Mr. Murphy. -- who would much rather be getting a paycheck than an unemployment check.

Mr. O'Sullivan. Absolutely.

Mr. Murphy. Thank you very much. I yield back.

Mr. Olson. [Presiding.] The gentleman yields back.

The chair calls upon the gentleman from West Virginia, Mr. McKinley, for 5 minutes.

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Mr. McKinley. Thank you, Mr. Chairman. I thought you were going to go to the other side.

Quickly, if I could get into it, 51 years ago I picked up a lunch pail and went out on my first construction job. It has been something that means a lot to me as a construction industry and I spent, again, 51 years in it. And now in the Washington, I am the chairman of the Construction Trades Council Caucus, trying to make sure that all our members understand the construction trades and what the impact of our construction industry has on the economy of this country.

Curiously, we only have about 12 or 15 members in Congress that have ever performed construction work. So you can imagine the educational process that we have to go through when people are concerned about part-time jobs. That is what we have done for 51 years is understanding that.

But my question, in part, is maybe it is almost an opening statement of sorts is I am frustrated for us in West Virginia because the last 8 years we have seen our coal industry collapse. So, we tried to switch over to natural gas and be able to exercise what we use in the Utica and Marcellus but we can't get permits to build our pipeline.

So my question, I guess maybe it would be at your, Mr.

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O'Sullivan, with laborers. Are you seeing a slowdown around the country of the ability to build pipelines and put our people to work?

Mr. O'Sullivan. Congressman, we are seeing a slowdown in the permitting process and I hate to keep going back to that but shovel-ready projects are only shovel-ready if there is a reasonable review process. And again, we are for comprehensive process but there has to be a beginning and an end.

West Virginia, in particular -- and I am a proud member of Laborers' Local 1353 in Charleston, West Virginia, and worked in the State for a number of years, and I appreciate your support all the years as well.

What we are seeing in West Virginia, in my local particularly, with what has happened to coal in the state, we have lost half our members. In many instances, natural gas pipelines have really helped our members out in the state. To be honest, we would have lost more than half our members if it wasn't because of that.

Mr. McKinley. We have apparently, if we can tap into it properly, the Marcellus, the Utica, and West Virginia, we could produce 50 percent of all the natural gas in America using that. However, we just can't get the permits to get

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those pipelines built. Of course, they are building some but not at the speed that we need to help out.

And so it is coming down to elected bureaucrats and delays and tactics or are we just putting people to work? If we can't mine coal for 8 years, we have seen the employment situation occur in West Virginia, well, actually, across the country, this anti-coal fervor that the Obama Administration put in place; 83,000 coal miners lost their job, 246 power plants closed down, 400 coal mines closed.

So we turn, with hope, that we can use the natural gas and build the pipelines so that we can put our people to work and find a new way, a different economy. But we are stymied and I don't want to see that happen in the Dakotas or elsewhere, where people are trying to find jobs, just jobs it comes down to.

So what advice would you give us, maybe -- I can't pronounce your name. I am sorry.

Mr. Mahmoud. That is okay. It is Mahmoud.

Mr. McKinley. Mahmoud.

Mr. Mahmoud. Yes, sir.

Mr. McKinley. What would be the best thing that we could do here in Congress to try to get the regulatory bodies to be more responsive so that the people that want to work,

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our building trades and elsewhere, what could we do to eliminate some of those barriers? The process is there but what else do we need to do?

Mr. Mahmoud. Yes, I think it all boils down to predictability, predictability in the process. And as long as it is fair across all industries, and for our industry on the energy side, we need predictable regulations that we can rely upon when we make these multi-billion dollar decisions and we need finality. So what happened on the DAPL project is very devastating to a company like ours, when we are investing nearly \$4 billion all of a sudden just to be halted by a political intervention.

Mr. McKinley. We talked to, I guess it was Barton, someone brought up the NEPA process and we saw that process abused in the last 8 years. They were trying to ship export coal from Bellingham, Washington and they didn't -- the NEPA process was underway with it but the administration just stepped in and stopped the NEPA process. That has got to be very frustrating to people that have spent \$7 million or \$8 million to get something approved.

I have got problems with this bureaucratic nonsense that we have to put up with sometimes around here.

So I yield back my time.

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Mr. Olson. The gentleman yields back. The chair calls upon the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. Griffith. Thank you very much.

Ms. Kann, let me ask you a couple of questions. As a part of the pipeline going through Pennsylvania, did you participate in the FERC processes?

Ms. Kann. I participated at every opportunity. I am registered as an intervenor and I have spoken at the FERC hearings.

Mr. Griffith. And was your experience with FERC a good one?

Ms. Kann. It was very neutral. There was no dialogue. There was no back and forth. There was a panel of people sitting on a stage who just sat. It wasn't dialogue. It was testimony.

Mr. Griffith. And I have a pipeline coming through my district, which is why I am asking these questions.

And do you feel that FERC should be able to look at, as opposed to one individual pipeline, perhaps multiple pipelines going through a region so that they might consider whether or not all the pipelines are needed?

Ms. Kann. Absolutely. Pennsylvania is slated for up to

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300,000 miles of pipelines in the next several years and they are both collection lines and interstate distribution lines.

The collective impact of that is an entirely different story than what FERC considers on a pipeline-by-pipeline basis.

Mr. Griffith. Yes, ma'am, that has been our experience as well.

And as a part of that, do you know if in your situation they looked at highway right-of-ways or co-location opportunities for the pipeline?

Ms. Kann. There was a great deal of dialogue in my community. The initial proposal from Williams for this pipeline route rather extensively used some existing public land and existing right-of-ways in our township. There was some outcry over that because some of the public lands had been bought with taxpayer and donation dollars. It was a conservancy land. And Williams quickly rerouted through private properties after that.

There was a second wave of proposals made by some of the residents in my township in particular to reroute back to some of that public land and FERC did not choose to make that move.

Mr. Griffith. I appreciate your testimony here today.

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Mr. Mahmoud, I know that you have already testified that you all did do some co-location. As your company was looking at this, did you all look at opportunities where you might be able to co-locate? And is the gas that you are piping through, is that something that you all believe is necessary, exclusive to other projects or are we -- my question is are we getting into a situation where we are using eminent domain for competing projects? Each standing alone would meet FERC's requirements but maybe together, we are overdoing it and building an oversupply of pipeline. Do think there are any concerns? And I will just open it up. You answer however you wish.

Mr. Mahmoud. Sure. Thank you very much.

You know in the context of natural gas, we do have the Rover pipeline, which is up partially in Pennsylvania for a small section. It is a 713-mile pipeline that gathers natural gas from the producing region of the Utica and Marcellus and takes it to market.

I can tell you there is about Bcf of stranded gas in the Utica and Marcellus today. Our project moves 3.25 billion cubic feet of that 20. So that means there is enough other pipeline -- or there is a need for more pipelines to be built in that region to take care of that capacity to de-bottleneck

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the production in that region.

So in my mind, those infrastructure projects are necessary to transport the volume coming out of that production region.

Mr. Griffith. One of the concerns that Ms. Kann has and I know gas companies want to try to work it out the best they can but everybody has got to make money while they are doing this, too, is that her region apparently isn't going to benefit from it. The gas is being transported through. Is that going to be the case in the Dakota pipeline as well or are there going to be some opportunities after the pipeline is built for opportunities there for people to get the gas?

Mr. Mahmoud. So the Dakota Access pipeline is a crude oil pipeline.

Mr. Griffith. Okay.

Mr. Mahmoud. That is a little bit different than natural gas.

Mr. Griffith. Sure.

Mr. Mahmoud. And I would suggest on the connectiveness or interconnectiveness to an interstate natural gas pipeline is the process for which to get access to that gas really resides with the States, with the State public utility commissions. That is where the work needs to be by the local

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constituents to help them develop programs to build LDCs to distribute that gas. Because from an interstate perspective, we would love to have more connections.

Mr. Griffith. All right, now on the oil in particular, a number of folks have brought up the fact that there have been some pipeline problems over the years but just on either side of my district, I have had train problems with transporting oil. Which do the studies say is safer, the pipeline or running it on train?

Mr. Mahmoud. Pipelines by far, by a factor of between three and a half to four and a half times more incidents on a rail than there are on pipe.

Mr. Griffith. All right, I appreciate that. I yield back, Mr. Chairman.

Mr. Olson. The gentleman yields back.

The chair calls upon the gentleman from Ohio, Mr. Johnson, for 5 minutes.

Mr. Johnson. Well thank you, Mr. Chairman, and thank you for having this important hearing today.

I want to turn to Mr. Ferry, if I could. Mr. Ferry, it is always good to have someone that has seen the impacts the shale plays in the oil and gas boom in the Marcellus and the Utica in the great State of Ohio here to talk a little bit

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about our experiences.

In your testimony, you state that widespread adoption of new energy technologies has been slowed by economic, government, and marketplace barriers. Could you identify these barriers? And how can we reduce these barriers to help the industry utilize new technologies?

Mr. Ferry. I think you heard a lot of it today from Mr. Mahmoud. Those are some of the issues that are going on that have slowed down -- the year 2016 we were supposed to be well done with the ETC Rover pipeline project and it is only going to kick off here in the middle of February. But it has been the permitting. It is the FERC permitting, the EPA issues. We need to -- and the balance between this side of the room and this side of the room and I am in the middle. I understand because I respect what is going on over there but we do want to put people to work.

We do have investors that have a lot of money sitting on the table that they need to get it to get a TAP capital return.

So, I would say the permitting issue is number one and then once this finally gets worked out, we are going to have major issues of finding talented people to get it done, that can do it safely. Number one, it is driven from the top. In

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our company, it is you see it, you own it, you have to get involved to stop it. But the other thing that we talked earlier about is I am really concerned about having a drug-free workforce out there to do it safely as we respect it on all jobs. The owners demand that we have a drug-free program in place and I think that is another issue that is going to hurt us in the long-run.

Mr. Johnson. Okay, could you discuss the Electrical Training Alliance Apprenticeship Program and how important it is in developing a skilled workforce?

Mr. Ferry. President Lonnie was here earlier from the IBEW but we, together, it is called the NJATC, the National Joint Apprenticeship Training, which was the alliance, we invest, like the Laborers' over hundreds of millions of dollars a year and there is over 300 training facilities across the United States and they are all keyed for every area what the training needs to be.

So just like Mr. O'Sullivan says, if the pipeliners are not working, there is other training that we can do to get our electricians to work. So our trade, the electrical trade, has went from just pipe and wire, and lights and switches, to a vast array of training needs to get that done.

Mr. Johnson. And I am thinking that many in our region

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of the country, in our State of Ohio are going to be paying very close attention to this hearing, so I want to make sure that I get this question out there. Is it safe to say that if you are a part of that trained workforce and you put forth the effort, that your chances of getting opportunities for good paying jobs, high paying jobs are real good?

Mr. Ferry. I would say it is an excellent opportunity.

Again, one of the things, one of jobs as being the leader of the company and having the vision, that is the biggest fear I have is having the talented people to make that happen. There is going to be great opportunities in Ohio, West Virginia, Pennsylvania, just the cracker facilities, along with the fracking and gas and oil, there is going to be a lot of great opportunities.

Mr. Johnson. You know I have talked to a lot of the labor groups and the career tech centers, and whether it is the building trades, the plumbers and pipefitters, the operating engineers, you name it, about these opportunities, can you talk a little bit about, especially in our region, you have got a lot of young people that don't really see a 4-year college education as something that they want to do. And there are a great number of opportunities in those trades, in the oil and gas industry.

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Can you address that some?

Mr. Ferry. Absolutely. I think the universities have done a great job in marketing that you need a 4-year degree to have an opportunity to raise a family but I am classic example of that. I come out of high school, I was the oldest of seven. We didn't have the money for college. I went into the trades and now I am the owner and CEO of a company.

So the possibilities to get into the construction industry is unlimited. It is all driven by the individual and how far they want to go in this industry.

Mr. Johnson. Anything that we can do in Congress to help this process along?

Mr. Ferry. I am leaning this side over here. The regulations have really slowed the processes down.

Mr. Johnson. We are working on those. You know that.

Mr. Ferry. Yes, sir, but I know when President Trump signed those orders on the 24th, our phones started ringing off the hook of opportunities.

Mr. Johnson. Our phones are ringing off the hook, too.

Mr. Ferry. Yes, sir.

Mr. Johnson. Good deal. Well, thank you, Mr. Ferry.

And Mr. Chairman, I yield back.

Mr. Ferry. Thank you, Congressman.

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Mr. Olson. The gentleman yields back.

The chair calls upon the gentleman from Missouri, Mr. Long, for 5 minutes.

Mr. Long. Thank you, Mr. Chairman. And as I was hearing you introduce my friend Mr. Johnson, I thought, well, I am next, so I had better get my questions ready.

And I looked and I couldn't find my questions. Then I started to listening to Mr. Johnson. I thought he is answering my questions. He had stolen my paper.

Mr. Johnson. Would you like some of mine?

Mr. Long. So, all I can do is I am going to yield to my friend from North Dakota.

Mr. Cramer. Thank you, I think. And thank you, Mr. Chairman. Again, thanks to all of you.

As I said, I want to dig into the consultation issue because I think it is important. And I am going to start by reading from an important to note December 3, 2016 memorandum of record from the Department of Army Corps of Engineers Omaha District. December third is important because it was on December fourth that the Acting Secretary of the Army called me to tell me I have changed my mind.

Okay, so December third, this was the memorandum. I am going to start at the end. It says the Corps of Engineers

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through the Department of the Army is required by statute to notify Congress when an application is received and when the Corps is going to grant an easement for a pipeline that is greater than 24 inches in diameter. The Army notified Congress of the application on September 13th of 2015 and, in accordance with this memorandum, I recommend the Army notify Congress the Corps intends to grant the attached easement to Dakota Access.

And it ends by saying after notification to Congress, the Omaha District intends to execute and issue the easement to Dakota Access. December 3, 2016.

I am going to highlight a couple more points in this memo, about halfway through. Corps policy is that it will coordinate and consult with federally-recognized Native American Tribes when reservation lands are involved. The proposed DAPL crossing at Lake Oahe is not on reservation lands. Therefore, by policy, there is no requirement to coordinate with any federally recognized Tribe. However, the Corps reached out to the Standing Rock Sioux Tribe to coordinate and to consult on the DAPL project.

As established in the analysis set forth in the final environmental assessment -- that is this document, Mr. Chairman -- the Corps attempted to engage in meaningful

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discussions with the Standing Rock Sioux Tribe on numerous occasions about the nature of the project, cultural resources, and the Lake Oahe crossing beginning in October of 2014 and continuing through March of 2016.

Mr. Chairman, I would respectfully request that both the Environmental Assessment and this memorandum be entered into the record.

Mr. Upton. [Presiding.] Without objection.

[The information follows:]

*****COMMITTEE INSERT 13*****

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Mr. Cramer. I also wanted to enter a decision by D.C. District Court, U.S. Judge James Boasberg for the United States District of Columbia appointed by President Barack Obama, for what it is worth.

I am going to skip several references to the consultation process that he references but I am going to jump to page 48 of this 58-page order.

Plaintiff's last point on the merits is that the Corps failed -- the Corps. This is important because Mr. Mahmoud referenced the importance of a government-to-government responsibility here -- the Corps failed to offer it a reasonable opportunity to participate in the Section 106 process as to the narrow scope of the construction activity that the Corps did consider to be an effect of the permitted waterway activities. And then it goes on to talk about the process.

He writes, the Corps has documented dozens of attempts to engage Standing Rock in consultations to identify historical resources at Lake Oahe and other PCN crossings. To the reader's relief -- and he is right -- the Court need not repeat them here. Suffice it to say that the Tribe -- the Tribe largely refused to engage in consultations. It chose, instead, to hold out for more.

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And then he writes, in fact, on this record, the Corps exceeded its National Historic Preservation Act obligations at many of the sites.

I am going to skip several other references. I will read this one on page 55. The record contains abundant evidence that the Corps also repeatedly sought other input on known cultural sites at these locations and, in many cases, other tries conducted site visits to search for any resources likely to be affected. And on he states.

But I think it is really important to highlight that he actually references here that in fact in this record it appears the Corps exceeded -- exceeded its NHPA requirements.

In conclusion, he writes, as it has previously mentioned, this Court does not lightly countenance any depredation of lands that hold significance to the Standing Rock Sioux. Aware of the indignities visited upon the Tribe over the last centuries, the Court scrutinizes the permitting process here with particular care. Having done so, the Court must, nonetheless, conclude that the Tribe has not -- has not demonstrated that an injunction is warranted here.

I will ask questions at my next opportunity. I yield.

Mr. Upton. The gentleman's time has expired.

Dr. Bucshon.

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Mr. Bucshon. Mr. Chairman, I yield my time to Mr. Cramer.

Mr. Cramer. Thank you, Mr. Bucshon. Thank you, Mr. Chairman.

And I would then ask for unanimous consent to enter into the record Judge Boasberg's ruling.

Mr. Upton. Without objection.

[The information follows:]

*****COMMITTEE INSERT 14*****

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Mr. Cramer. All right, thank you. I do want to get into this consultation process a bit. One of the things that we heard that I want to dig into, Mr. Mahmoud, is that Mr. Harrison, in his testimony references consultation, meaningful consultation, government-to-government. These are all things I think we need to be talking about, especially going forward. I don't think you can change in midstream.

But he also references something that I think is relevant to this entire hearing and he references the need for consent. Now, consultation is one thing. Consent means something completely different. Could you tell me, as a developer, what would it mean if every development of any type required the consent of Tribal entities on private property outside of a reservation? How would that impact development going forward?

Mr. Mahmoud. Thank you for the question. Consent is something is something that we, from a development standpoint would probably not have a -- we would not agree to that from a standpoint of -- the process already exists today, where the consultation under the federal laws is intact. Where, if the Tribes, no matter what Tribe in what State, would engage in that consultation and really and really engage in meaningful consultation, then I believe that their voices

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would be more heard and I believe that their questions could be answered. And then I believe that we would have a more robust process.

So, I don't believe consent is the answer. I believe meaningful engagement is the answer under the current laws, as they stand today.

Mr. Cramer. Thank you for that. Mr. Harrison, I want to ask you, because you have referenced -- and I think this is an important point -- you have referenced treaty issues. I think you acknowledge that this DAPL does not cross reservation land. Is that correct?

Mr. Harrison. The reservation as it stands today, yes.

Mr. Cramer. Correct. And the big hole that you referenced in the previous map really wasn't treaty land where there is a hole because clearly, the two pipelines that are in the same corridor as the DAPL are on the land that is in dispute right now.

So you referenced treaty. Tell me which treaty you are referencing and maybe give us, I don't know if 30 seconds is enough. You are a good educator but I don't know how much time you need. Just tell us about that treaty and what is at stake here.

Mr. Harrison. Okay, the treaty that we reference is the

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1851 Fort Laramie Treaty. And that is a larger part of four or five States, basically the western corner, the southwest corner of North Dakota, large part of South Dakota, probably half of South Dakota, I should say, parts of Montana and Wyoming as well. And that is the treaty line that we reference.

Mr. Cramer. So since we are on that, then what can you tell me about the Laramie Treaty of 1868, which is obviously after 1851, because that is on your website. You probably know that. And that, I believe, in that treaty the Tribe gives up some of its authority, if you will, over these other treaty lands.

Can you sort of clarify that for us a little bit?

Mr. Harrison. I will clarify this, that the Tribe has never given up anything. It was taken. And that is a big point of contention on this.

Mr. Cramer. So what is your recourse then with regard to the Treaty of 1868? Because I think, if I am not mistaken, I think that is sort of where we land on some of what is in contention. Because clearly, again, it is not on the reservation.

Mr. Harrison. I guess I would disagree a little bit on the fact that that is not where we land. We land on the fact

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that we do have a government-to-government relationship. It is very clear that this process is not only flawed but it is not in the Tribe's favor at all. And whether meaningful consultation is had, the big question is, is it listened to. We can object until we are blue in the face and if that pipeline, or any other pipeline, or any other project, whether it affects us or townspeople like Ms. Kann here, it still goes in and says we noted that is the problem we have. We do not approve of the checking the box attitude of it.

We reached out to you. Check. We oppose that. We want consultation. We want meaningful dialogue.

Mr. Cramer. But Judge Boasberg claims that there were dozens of attempts at meaningful consultation but the Tribe wouldn't --

Mr. Harrison. Judge Boasberg also scrutinizes the process and acknowledges that there has been decades, if not centuries of problems with this.

Mr. Cramer. Well and I think that is the problem. We are not going to litigate the history in this one project but that is why I wanted to clarify things going forward so that perhaps we can do better going forward.

I yield back.

Mr. Harrison. And we would really like to be a part of

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that dialogue going forward to look for some resolution to a lot of these things and to be included.

As I stated at the outset, we are Americans. We are the first Americans and we want to be treated as such.

Mr. Cramer. Thank you.

Mr. Harrison. Thank you.

Mr. Olson. [Presiding.] The gentleman yields back. The chair calls upon the gentleman from Maryland, Mr. Sarbanes, for 5 minutes.

Mr. Sarbanes. Thank you very much, Mr. Chairman. Obviously, a very important hearing. I want to thank the panel. This is a critical discussion whenever we are siting a pipeline or any other kind of energy infrastructure project, it is important that we balance all of the various interests. I certainly think that means being sensitive to impacted constituencies and that is a challenge for us and a challenge for all the agencies that have to weigh these important decisions. So, it is a very important discussion that we are having.

I would like to yield the balance of my time to Mr. Ruiz from California.

Mr. Ruiz. Thank you. And thank you, Mr. Chairman. I want to thank the committee for holding this important

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hearing and our witnesses for coming. Thank you for coming to tell your stories. They are important stories. Each and every one of your stories is an important story.

And this is a story of the federal permitting process being rushed and fast tracked without meaningful Tribal consultations. We have had multiple conversations of what that means to be meaningful. And if done properly, and according to law, could have avoided the delays that are harming families, harming workers, and could have prevented the desecration of very important sacred sites. It is a story about environmental injustice taking a risk burden from one community and putting it on a more vulnerable community's shoulders. It is a story about how our nation is, once again, trampling on the rights of Native Americans and threatening the health, environment, and cultural survival of the surrounding Tribes.

It is also a story of an administration that fast tracked the project, despite the serious warnings and strong recommendations by the EPA, the Department of the Interior, the National Council of Historic Preservation, circumventing the already in-process environmental impact statement review in order to line its own pockets. You see the Federal Government has a moral and legally enforceable obligation to

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protect Tribal treaties, land, and resources under the federal trust responsibility. Tribes have the right to regular and meaningful consultation under Executive Order 13175 for projects that can have an impact on health or Tribal land.

Under the Historic Preservation Act, federal agencies are required to be responsible stewards of the Nation's historic resource and consult with Tribes when their actions may impact sacred sites.

Furthermore, under the Clean Water Act, the Army Corps has the responsibility to protect our nation's waters from contamination by conducting accurate environmental assessments to determine if construction permits should be granted and all those other agencies said that that initial assessment was inaccurate.

So, it is not just the right thing to do, based on our historical experiences and historical traumas with Native Americans, it is the law.

So, now we find ourselves confronting an historical violation of both civil rights and Tribal sovereignty all because the procedural safeguards of the meaningful consultation process were not followed.

The proposed pipeline was determined to be too risky

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already for one community in Bismarck. So, let's put it in a more vulnerable community. Why did that happen? Why is it now acceptable that we give the risk -- put the risk onto the Tribes?

I want to reiterate again that the workers are caught in the middle of this failed system. Tribes and working families want the same thing, a better quality of life for themselves and their families, a fair opportunity to have a say in decisions that may affect their health, cultural preservation and their environment. They want to be heard, a seat at the table.

So I stand with the Tribes and I am greatly disappointed that this administration has ignored scientific evidence requiring an environmental impact statement. I also stand with the workers because it is unfair to them and their families that they should suffer because of a failed permitting process.

So in terms of the sacred sites, on September 2, 2016, shortly before my visit to Lake Oahe and the Sacred Stone Camp, the Tribe filed paperwork with the court that identified sacred and culturally significant sites that were miles apart from the construction site but in the proposed line of construction. Not even 24 hours later, in the middle

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of the night, on a holiday weekend, Labor Day, DAPL bulldozed and completely demolished the site the Tribes were trying to save and had identified earlier.

Time after time Tribes have seen their treaties broken, their lands taken, and sacred sites desecrated.

So, Mr. Mahmoud, I want to ask is it standard practice to go and at 3:00 a.m. on a holiday weekend to bulldoze a site that has been designated as a culturally significant site by the Tribe?

Mr. Mahmoud. Thank you for the question. And let me start off with I believe that a lot of what you said is the reason we are here today is to correct the record.

Mr. Ruiz. Well, the record shows that you guys at 3:00 a.m. on a holiday weekend went over and specifically bulldozed over a site that was so sensitive to the Tribe. So, that is what the record shows.

Mr. Mahmoud. So let me back up a little bit and start off with the pipeline parallels and existing utility corridor, that was constructed in 1982. As part of that, the swath of the land where our pipeline sits simply disturbed all the land --

Mr. Ruiz. Well my question is on the timing and the day of the actual decision to go in and desecrate a sacred site.

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Mr. Olson. The time has expired.

The chair calls upon the gentleman from Texas, Mr. Flores, for 5 minutes.

Mr. Ferry. Mr. Chairman, I need to excuse myself. I have a flight to catch and I apologize.

Mr. Olson. Oh. Thank you very much for coming, Mr. Ferry. Safe travels home.

Mr. Ferry. Thank you.

Mr. Olson. Mr. Flores, your time, sir.

Mr. Flores. Thank you, Mr. Chairman. Mr. Ferry, I want to tell you thank you for your story and your testimony today, as well as the rest of the panel. Your story was inspiring.

Mr. O'Sullivan, when I talk about the Keystone pipeline back home and the DAPL, most of my constituents get it. They understand the value of jobs, any job. But there are some that don't. Some say that we shouldn't build these infrastructure projects because they are temporary jobs. And so I would like you to ask the people who would be affected by that logic, that failed logic, who would be affected? If every job was a temporary job and so, therefore, there should be no temporary jobs, who would be affected? Would you ask them to stand up?

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Mr. O'Sullivan. Well Congressman, I mean those that say that, and there have been some --

Mr. Flores. But would you ask them stand? I mean you have got some here with you, don't you?

Mr. O'Sullivan. Yes, whether it is Keystone pipeline, we could argue over the amount but there has been estimates as high as 42,000.

Mr. Flores. I know but I want the American people to see the eyes of the people who would be affected by that false logic.

Mr. O'Sullivan. And the eyes of the people who would be affected are sitting right behind me.

Mr. Flores. Would you ask them to stand?

Mr. O'Sullivan. Yes, I would.

Mr. Flores. Okay, thank you.

Mr. O'Sullivan. Would my brothers and sisters from LIUNA stand?

Mr. Flores. Thank you. Okay, sit down. Thank you. Apparently, I was out of order. Anyway, people got to see that.

So that logic doesn't work. And essentially, an infrastructure project -- you know we are talking about infrastructure in this country and trying to renew our

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infrastructure. So, infrastructure is a series of temporary projects. Is there any difference between the value of a temporary paycheck and a full-time paycheck? It is still a great paycheck, right, based on what you told me you pay earlier.

Mr. O'Sullivan. Absolutely.

Mr. Flores. Okay, that is good to hear.

So, I would like to continue. Even as we migrate to a low-carbon economy, fossil fuels are still going to be a key fuel, a key energy source for the years to come. And so in that regard, why is it important that we establish a more reasonable and predictable permitting and review process for complex infrastructure projects like pipelines?

Mr. O'Sullivan. From my perspective, the reason for that is is that there has to be, as I have said, a beginning and an end. The regulatory process, and it needs to be thorough, no question about that, is that it needs to be a process where there is a reasonable expectation that when these projects are announced and they are thoroughly reviewed, that they lead to middle class family-supporting jobs. And one of the challenges we have, and I know Joey and ETP, and others have, is the delivery system of workers because if we start training now for a project that isn't

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complete, those individuals may never go to work and we can turn them off about a whole sector of an industry.

So, if we don't fix some of the things that we have been talking about in this hearing, it is going to affect our ability to provide a capable and skilled workforce.

Mr. Flores. I think you answered the question pretty well and I am sorry to cut you off.

Mr. O'Sullivan. That is all right.

Mr. Flores. So in order to move forward with the big infrastructure ambitions that we have as a country we need to modernize the permitting process so that we can benefit these hard-working American families and so that their so-called temporary jobs become a series of temporary jobs that leads to a vibrant middle class. And I thank you for that.

Mr. Mahmoud, you talked about the fact that if this pipeline is not built, we are going to have to use trucks or trains. You talked about the relative safety impacts.

One of the things we didn't talk about is the climate impact of a pipeline versus trucks or trains. So when you look at trucks, trains, and pipelines, which has the lowest carbon footprint in terms of fuel transportation?

Mr. Mahmoud. Pipelines by far.

Mr. Flores. Okay, thank you. And one of the things you

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talked about, you touched on this a minute ago, you are going to bury this thing 90 to 115 feet below this reservoir and below the river, which is very unusual. Most pipelines are in the 15- or 5- to 25-foot range.

Tell me about why you did that. I mean there is a geological subsurface issue here that -- just tell me why you are doing that.

Mr. Mahmoud. Okay. And you are right, it is all about geology. So we have to span -- the crossing of the waterway in that particular location is 5,400 feet. So, it is an engineering issue and it is also a geology issue.

At that location, there is sand, and clay, and some gravel, and then there is what is called a clay shale. And so part of the design was to put the pipeline in the soil band that is most conducive to allow that drill to be successful. And then you have to engineer to make the inflections or the bends in the pipe so the pipe can withstand the forces on it when you are pulling it through the hole. So, it is a combination of engineering design and geology that puts you to a depth. And in this case, we wanted to be as deep as we could.

Mr. Flores. And the bottom line is, it becomes a much safer pipeline because you are doing it that way.

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Mr. Mahmoud. One hundred percent. That is exactly right.

Mr. Flores. Thank you. I yield back.

Mr. Olson. The gentleman yields back.

The chair calls upon the gentleman from Oklahoma, Mr. Mullin, for 5 minutes.

Mr. Mullin. Thank you, Mr. Chairman. And as my colleague from West Virginia was referring to, there is only a few of us that have been on construction sites. I traded in my Carhartt's and Red Wings when I got elected to office and had to learn how to tie a tie and buy my first suit. True story.

For my guys that are sitting in the back representing the labor force, special labor force across the country, I wish you guys weren't here. I wish you were on a jobsite. You know if they use the logic that this is considered a temporary job, then all 150 of my employees are a day-by-day employee but I think they consider themselves full-time, considering some of them have been working for me from 17 to 20 years. It just shows the lack of understanding and the lack of knowledge.

And we are talking about construction jobs. And Republicans and Democrats have all been saying we have got a

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job package, we have got a job package. And the only reason why I ran is because I was saying get your foot off my neck and I will go to work but we can't because of all the political correctness and all the in-house fighting and all the permits that has got to be used and it gets old.

And Mr. Harrison, I am Cherokee. I understand very well sacred sites and heritage sites. It is our heritage. I want to protect them, too. It is vitally important to me. I live in the same spot that my family literally quit walking on the volunteer walk until we got to Indian territory which is known as Oklahoma.

I still own the same land that was allotted to my family and there is a utility easement that goes across it. And I was glad to grant the utility easement because it is not just about our backyard but it is about the country as a whole. What is good for your backyard is good for the country and it is going to create jobs in your backyard, too. And you misrepresent it by starting to say that it is an 1851 Treaty but you are not referring to the 1868 Treaty -- is that what it was? But yet you want to talk about government-to-government relationships and yet you want to honor what is in one treaty but you don't want to use that one; you actually want to refer back to the other treaty. It seems a little

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hypocritical to me.

We want to talk about not engaging and having meaningful conversations between government-to-government but yet they try to engage with you guys 389 times. Is that not enough? What do you consider meaningful meaningful conversations between government-to-government?

Mr. Harrison. An actual dialogue, perhaps.

Mr. Mullin. You have been engaged 389 times. You have had time to have a dialogue. Because coming out of those non-meaningful, according to you, but 389 times which, by the way, is why we can't build pipelines, they moved it 140 times.

Mr. Harrison. Not on our land. That was on --

Mr. Mullin. Well those were meaningful conversations, weren't they?

Mr. Harrison. Those weren't our conversations.

Mr. Mullin. Were they not taken into consideration?

Mr. Harrison. Those were not our conversations.

Mr. Mullin. How many times have you guys been invited to be at the table?

Mr. Harrison. Numerous. I met with Joey myself.

Mr. Mullin. And those weren't meaningful?

Mr. Harrison. No, they were proprietary and

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confidential.

Mr. Mullin. So the only way that it was going to be is it was going to be moved, regardless of what you guys wanted. It was going to be -- go where? You didn't want it on an existing easement that has already been there since 1982, which means that that soil had already been dug before. There has already been environmental impact studies. There have already been sacred sites looked at. And you don't want it there. So, where do you want it?

The answer is you don't want it. You just don't want it.

Mr. Harrison. No, we just --

Mr. Mullin. Because if you don't want it right there, you are wanting it to reroute it someplace else. But through Indian country, every time we dig up certain places because we occupied all the land, it can all be considered sacred at some point.

Now, if I am making a decision of where I want a pipeline because we need the infrastructure, I would rather put it on an existing easement that has been there since 1982 that we already know, for the most part, what is underneath the soil. Wouldn't you?

Mr. Harrison. Not in this case, no.

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Mr. Mullin. So you would rather it just be routed someplace else and dig up new soil and you are not worried about those sacred sites.

Mr. Harrison. At the risk of --

Mr. Mullin. At the risk of what?

Mr. Harrison. Can I finish?

Mr. Mullin. Yes, I mean risk of what?

Mr. Harrison. At the risk of us guys taking all the risk --

Mr. Mullin. Us guys, who is us guys? This isn't going across Tribal land because this wasn't actually in the last treaty. So a risk of what?

Mr. Harrison. A risk of a breach. A risk of a spill.

Mr. Flores. A breach of what?

Mr. Harrison. The oil pipeline.

Mr. Flores. What are they breaching? They are not going across what you consider the current treaty. They were going outside of it.

Mr. Harrison. The river that flows goes into our treaty land, across our reservation.

Mr. Flores. But they have already crossed it and it has been crossed upstream multiple times, too.

Mr. Harrison. They could have cross anywhere else

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upstream.

Mr. Flores. So you are okay with it going upstream, which doesn't make any sense because if there was a breach, and that means the oil would flow downstream.

Mr. Olson. The gentleman's time has expired.

The chair now calls upon the gentleman from California, Mr. Ruiz for 5 minutes.

Mr. Ruiz. Thank you very much. You know this is the same old song that we have been dealing with in our relationships with Tribes throughout our country's initiation. It is a historical trauma of paternalistic disrespect, political trickery that abuses laws and policies, then we interpret them during our own convenience, in terms of the Federal Government, in order to tell you what to think, what to say, and then also put the blame of that historical trauma and experience on your shoulders to then turn around and say it is your fault.

I think it is a shameful way to treat Native Americans and the first people and this must end. This must end in our country. This must end to relieve our historical trauma. You are not a hypocrite for standing up for your historical reasons to say that that water that is not on your land has a vital component to your land, your life, your drinking water,

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and all those people that depend on it downstream.

It is not hypocritical when somebody does not ask you where your sacred sites are to bring your opinion in there to say wait a minute, all throughout the pipeline construction can you just at least ask me, ask our Tribe where we think our cultural sites are? We will work with you. It is not hypocritical for you to extend your hands with labor and others to say listen, build it somewhere else. Right now we are living in the now and the moment and this is a great risk for our Tribe, for future generations, for our ability to drink this clean water. So hey, if you want to reroute it into some other place and build more pipe and lay more pipes for more hours of work and more construction and more jobs, then go for it but just not now, not in the water source that we drink.

Executive Order 13175 says any project that has an impact to the land or the health of Tribes. Don't we all, as Americans, deserve the right to self-determination and have a right on decisions that may affect our children's health, our sacred lands and our future? Isn't that a fundamental value of the democratic process? Isn't that a fundamental American value that we must stand up for? Isn't that the value of the working families that want to have a say in what we do for

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our livelihood and have a fair shot and benefits package so that we can claim our rightful place in this nation's great industry and economy?

So this is what is at stake now and I am so tired of the Federal Government not respecting the meaningful consultation.

Notification is not meaningful consultation. Engagement is not meaningful consultation. Asking somebody to come to your meeting so they can check off a box and use that as an excuse to say see, we did consult with these Tribes is political trickery. It is not meaningful consultation.

Meaningful consultation is consulting, having dialogue, understanding the concerns, the risks at the beginning, before a plan was made and come to say hey, listen, this is what we are going to do. I want you to sign this box so we can get on with it. No, it is to talk about not only the design, the location, the compromises, the negotiations, the rerouting, the mitigation risks, and all the cleanup super funds that need to exist so that the burden of cleanup and the risks aren't just placed on Native Americans. That is meaningful consultation.

This is not about not creating jobs. This is not about not helping the labor force to have a dignified job with a

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future for your families. This is about respecting Tribes and ending, once and for all, the historical trauma that they have faced in our nation.

What is meaningful consultation for you, Mr. Harrison?

Mr. Harrison. It is an actual dialogue. I just want to refer to Congressman Mullin. That wasn't meaningful dialogue. That is the way things have been going when we get peppered when we walk into the room. Rather than hear our side out, we get peppered with the hypocrisy, the numbers of however many times they dialed our phone number. That is not meaningful consultation.

Consultation comes in the planning stages. Consultation comes beforehand, when they can actually make some adjustments prior to. They have consulted other Tribes. Apparently, they have made 144 two-foot diversions. The pipeline is still going where it is going to go.

Mr. Ruiz. I really want to get to the bottom of this and fix a problem so that our workers don't have to be caught in the middle of this anymore and in the future. Let's define what meaningful consultation is.

I have a GAO study that I requested to determine whether or not the Federal Government is in compliance with that. The previous administration has conducted a multi-agency

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investigative study to determine what does impact and meaningful consultation mean. So, let's start looking from those to put those into practice and implementation.

Mr. Olson. The gentleman's time has expired.

The chair now calls upon our final witness, Mr. Cramer, from North Dakota.

Mr. Cramer. Thank you, Mr. Chairman. Again, thanks to all of you for being here. Mr. Harrison, special thanks and welcome to you.

It is hard to respond to that kind of raging nonsense but I do have to say a couple of things.

First of all, you have to, if you are invited into meaningful consultation but don't show up, it is not the person that invited you into the consultation that there wasn't meaningful consultation. You have to show up when you are invited and at least respond to the request.

I want to get to another thing that Mr. Ruiz kept saying. There are many fake news stories, many fake news stories related to this but perhaps one of the most egregious is this notion that there was once a route through north of Bismarck that was denied by all the white people in Bismarck, therefore, they had to move it down upstream from the reservation. That is just not true. That is blatantly not

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true.

I have sited many pipelines and this route was chosen because it is the most direct, because it is an existing corridor that the Tribe, by the way, did not oppose 35 years ago when two other pipelines and a transmission line went across it.

So we have just got to get back to reality. There is a Tesoro refinery on the west side of the Missouri River in Mandan, North Dakota that employs many union workers. We are very proud of that refinery. That refined product goes under the Missouri River, right through Bismarck, on to Fargo, North Dakota. Nobody ever complains about it. We are happy to have it. There is a pipeline two houses down from mine. I am glad to have it there. I am grateful the warmth it brings.

I want, though, to speak in my final moments maybe with you, Mr. O'Sullivan. One of my dearest friends in this body is David Scott, a Democratic Member of the congressional Black Caucus from Atlanta, Georgia, who might be organized labor's biggest friend in the Congress. He and I worked together on the Keystone pipeline. We worked together on several other energy projects. We have introduced this year legislation similar to what he wanted in the Keystone

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pipeline to encourage the unions, encourage the companies, encourage the government in their process of utilizing labor, obviously, training and apprenticeship programs to put a special emphasis on a social problem and that is, jobs for young black men.

I would just love to hear more about how your union and how your membership reaches out to our minority community to provide -- okay, call me biased I suppose for wanting to give a hand up, a leg up to certain populations that I think need it, frankly, and that have earned it but help me understand how we can maybe do more with our minority population and identify opportunities.

Mr. O'Sullivan. Well, Congressman, I can tell you what we do in the Laborers' International and that is is that when we have opportunities like we do with ETP and other pipeline owners and users. And a lot of times because work is good in the energy sector, we have to recruit young men and women into our organization, train them, and put them on projects like Dakota Access pipeline.

We work with faith-based groups. We work with local high schools, as we have we talked a number of times today about those that aren't ready to go to college or want an alternative career. So, our commitment to diversity in

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trying to do as much local hire as we possibly can is second to none.

There is golden opportunities to work with people of color, faith-based groups, community groups, even community colleges to recruit the workforce of tomorrow.

Mr. Cramer. So Mr. Harrison raised a very important point about what is in it for us, so to speak. Those are my words, not yours. You are more eloquent. But related to none of the workers are ours, could we try -- they have wonderful community colleges. Sitting Bull is a great college down in Standing Rock. United Tribes Technical College in Bismarck has worked with the industry to identify some skills that they could train. Let's commit at least to that, to providing more opportunities to provide jobs that I think could cure a lot of the social challenges, as well as the relationship challenges that we seem to be facing today.

Mr. Mahmoud, how does that sound for a plan going forward?

Mr. Mahmoud. We absolutely support that plan. We would love to increase diversity in our workplace, as well as on the construction side.

With that, my last 10 seconds, Mr. Chairman. Thank you. Again, thanks to all of you. A special thanks and welcome to

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Mr. Harrison and Mr. O'Sullivan.

Mr. O'Sullivan. Congressman, I could say that along with faith-based groups and the other groups, we have worked with Native American Tribes, not only in the U.S. but in Canada as well.

Mr. Cramer. All right, I appreciate it. Thank you.

Mr. Olson. The gentleman's time has expired. Seeing there are no further members who wish to ask questions of the second panel, I would like to thank all of the witnesses today for being here.

And pursuant to committee rules, I remind members that they have 10 business days to submit additional questions for the record. I would ask that the witnesses submit their response within 10 business days upon receipt of those questions.

I also ask unanimous consent to enter these five lists of documents for the record: The Clean Line Energy Partners letter, the Industrial Energy Consumers of America letter; the National Rural Electrical Cooperative Association letter; the Association of Oil Pipe Lines letter; and a letter from the National Urban League, without objection. So ordered, without objection.

[The information follows:]

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*****COMMITTEE INSERT 15*****

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Mr. Olson. This subcommittee is adjourned.

[Whereupon, at 3:57 p.m., the subcommittee was
adjourned.]

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